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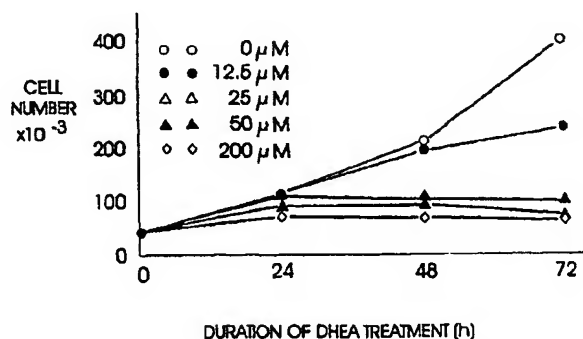
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(54) Title: COMPOSITIONS, FORMULATIONS AND KIT WITH ANTI-SENSE OLIGONUCLEOTIDE AND ANTI-INFLAMMATORY STEROID AND/OR UBIQUINONE FOR TREATMENT OF RESPIRATORY AND LUNG DISEASE



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(57) Abstract: A pharmaceutical composition and formulations comprise preventative, prophylactic or therapeutic amounts of an oligo(s) anti-sense to a specific gene(s) or its corresponding mRNA(s), and a glucocorticoid and/or non-glucocorticoid steroid or a ubiquinone or their salts. The agents, composition and formulations are used for treatment of ailments associated with impaired respiration, bronchoconstriction, lung allergy(ies) or inflammation, and abnormal levels of adenosine, adenosine receptors, sensitivity to adenosine, lung surfactant and ubiquinone, such as pulmonary fibrosis, vasoconstriction, inflammation, allergies, allergic rhinitis, asthma, impeded respiration, lung pain, cystic fibrosis, bronchoconstriction, COPD, RDS, ARDS, cancer, and others. The present treatment is effectively administered by itself for conditions without known therapies, as a substitute for therapies exhibiting undesirable side effects, or in combination with other treatments, e.g. before, during and after other respiratory system therapies, radiation, chemotherapy, antibody therapy and surgery, among others. Each of the agents of this invention may be administered directly into the respiratory system so that they gain direct access to the lungs, or by other effective routes of administration. A kit comprises a delivery device, the agents and instructions for its use.



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**COMPOSITIONS, FORMULATIONS & KIT WITH ANTI-SENSE
OLIGONUCLEOTIDE & ANTI-INFLAMMATORY STEROID AND/OR UBIQUINONE
FOR TREATMENT OF RESPIRATORY & LUNG DISEASE**

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BACKGROUND OF THE INVENTION

Field of the Invention

This invention concerns itself with compositions, formulations and kits employed for the administration of active agents that are effective for treating respiratory and pulmonary diseases including bronchoconstriction, impaired airways, decreased lung surfactant, asthma, rhinitis, acute respiratory distress syndrome (ARDS), infantile or maternal RDS, chronic obstructive pulmonary disease (COPD), allergies, impeded respiration, lung pain, cystic fibrosis (CF), infectious diseases, cancers such as leukemias, lung and colon cancer, and the like, and diseases whose secondary effects afflict the lungs. The active agents, anti-sense oligonucleotides and steroid agents and/or ubiquinones may be administered preventatively, prophylactically or therapeutically as a single therapy or in conjunction with other therapies.

Background of the Invention

Respiratory ailments, associated with a variety of diseases and conditions, are extremely common in the general population, and more so in certain ethnic groups, such as African Americans. In some cases they are accompanied by inflammation, which aggravates the condition of the lungs. Asthma, for example, is one of the most common diseases in industrialized countries. In the United States it accounts for about 1% of all health care costs. An alarming increase in both the prevalence and mortality of asthma over the past decade has been reported, and asthma is predicted to be the preeminent occupational lung disease in the next decade. While the increasing mortality of asthma in industrialized countries could be attributable to the depletion reliance upon beta agonists in the treatment of this disease, the underlying causes of asthma remain poorly understood. Respiratory and pulmonary diseases such as asthma, allergic rhinitis, Acute Respiratory Distress Syndrome (ARDS), including that occurring in pregnant mothers and in premature born infants, pulmonary fibrosis, cystic fibrosis (CF), chronic obstructive pulmonary disease (COPD), and cancer, among others, are common diseases in industrialized countries. In the United States alone they account for extremely high health care costs, and their incidence has recently been increasing at an alarming rate, both in terms of prevalence, morbidity and mortality. In spite of this, their underlying causes still remain poorly understood.

Asthma is a condition characterized by variable, in many instances reversible obstruction of the airways. This process is associated with lung inflammation and in some cases lung allergies. Many patients have acute episodes referred to as "asthma attacks," while others are afflicted with a chronic condition. The asthmatic process is triggered in some cases by inhalation of antigens by hypersensitive subjects. This condition is generally referred to as "extrinsic asthma." Other asthmatics have an intrinsic predisposition to the condition, which is thus referred to as "intrinsic asthma," and may be comprised of conditions of different origin, including those mediated by the adenosine receptor(s), allergic conditions mediated by an immune IgE-mediated response, and others. All asthmas have a group of symptoms, which are characteristic of this condition: bronchoconstriction, lung inflammation and decreased lung surfactant. Existing bronchodilators and anti-inflammatories are currently commercially available and are prescribed for the treatment of asthma. The most common anti-inflammatories, corticosteroids, have considerable side effects but are commonly prescribed nevertheless. Most of the drugs available for the treatment of asthma are, more importantly, barely effective in a small number of patients.

Acute Respiratory Distress Syndrome (ARDS), or stiff lung, shock lung, pump lung and congestive atelectasis, is believed to be caused by fluid accumulation within the lung which, in turn, causes the lung to stiffen. The condition is triggered within 48 hours by a variety of processes that injure the lungs such as trauma, head injury, shock, sepsis, multiple blood transfusions, medications, pulmonary embolism, severe pneumonia, smoke inhalation, radiation, high altitude, near drowning, and others. In general, ARDS occurs as a medical emergency and may be caused by other conditions that directly or indirectly cause the blood vessels to "leak" fluid into the lungs. In ARDS, the ability of the lungs to expand is severely decreased and produces extensive damage to the air sacs and lining or endothelium of the lung. ARDS' most common symptoms are labored, rapid breathing, nasal flaring,

cyanosis blue skin, lips and nails caused by lack of oxygen to the tissues, breathing difficulty, anxiety, stress, tension, joint stiffness, pain and temporarily absent breathing. ARDS is commonly diagnosed by testing for symptomatic signs, for example by a simple chest auscultation or examination with a stethoscope that may reveal abnormal symptomatic breath sounds. A preliminary diagnosis of ARDS may be confirmed with chest X-rays and the measurement of arterial blood gas. In some cases ARDS appears to be associated with other diseases, such as acute myelogenous leukemia, with acute tumor lysis syndrome (ATLS) developed after treatment with, e.g. cytosine arabinoside. In general, however, ARDS appears to be associated with traumatic injury, severe blood infections such as sepsis, or other systemic illness, high dose radiation therapy and chemotherapy, and inflammatory responses which lead to multiple organ failure, and in many cases death. In premature babies ("premies"), the lungs are not quite developed and, therefore, the fetus is in an anoxic state during development. Moreover, lung surfactant, a material critical for normal respiration, is generally not yet present in sufficient amounts at this early stage of life; however, premies often hyper-express the adenosine A₁ receptor and/or underexpress the adenosine A_{2A} receptor and are, therefore, susceptible to respiratory problems including bronchoconstriction, lung inflammation and ARDS, among others. When Respiratory Distress Syndrome (RDS) occurs in premies, it is an extremely serious problem. Preterm infants exhibiting RDS are currently treated by ventilation and administration of oxygen and surfactant preparations. When premies survive RDS, they frequently develop bronchopulmonary dysplasia (BPD), also called chronic lung disease of early infancy, which is often fatal.

The systemic administration of adenosine was found useful for treating SVT, and as a pharmacologic means to evaluate cardiovascular health via an adenosine stress test commonly administered by hospitals and by doctors in private practice. Adenosine administered by inhalation, however, is known to cause bronchoconstriction in asthmatics, possibly due to mast cell degranulation and histamine release, effects which have not been observed in normal subjects. Adenosine infusion has caused respiratory compromise, for example, in patients with COPD. As a consequence of the untoward side effects observed in many patients, caution is recommended in the prescription of adenosine to patients with a variety of conditions, including obstructive lung disease, emphysema, bronchitis, etc, and complete avoidance of its administration to patients with or prone to bronchoconstriction or bronchospasm, such as asthma. In addition, the administration of adenosine must be discontinued in any patient who develops severe respiratory difficulties. It would be of great help if a formulation were to be made available for joint use when adenosine administration is required.

Allergic rhinitis afflicts one in five Americans, accounting for an estimated \$4 to 10 billion in health care costs each year, and occurs at all ages. Because many people mislabel their symptoms as persistent colds or sinus problems, allergic rhinitis is probably underdiagnosed. Typically, IgE combines with allergens in the nose to produce chemical mediators, induction of cellular processes, and neurogenic stimulation, causing an underlying inflammation. Symptoms include nasal congestion, discharge, sneezing, and itching, as well as itchy, watery, swollen eyes. Over time, allergic rhinitis sufferers often develop sinusitis, otitis media with effusion, and nasal polyposis that may exacerbate asthma, and is associated with mood and cognitive disturbances, fatigue and irritability. Degranulation of mast cells results in the release of preformed mediators that interact with various cells, blood vessels, and mucous glands to produce the typical rhinitis symptoms. Most early- and late-phase reactions occur in the nose after allergen exposure. The late-phase reaction is seen in chronic allergic rhinitis, with hypersecretion and congestion as the most prominent symptoms. Repeated exposure may cause hypersensitivity to one or many allergens. Sufferers may also become hyperreactive to non-specific triggers, such as cold air or strong odors. Non-allergic rhinitis may be induced by infections, such as viral infections, or associated with nasal polyps, as occurs in patients with aspirin idiosyncrasy. In addition, pregnancy, hypothyroidism, and exposure to occupational factors or medications may cause rhinitis, as well. NARES syndrome, a non-allergic type of rhinitis associated with eosinophils in nasal secretions, typically occurs in middle-aged individuals and is accompanied by loss of smell. Saline is often recommended to improve nasal stuffiness, sneezing, and congestion, since saline sprays usually relieve mucosal irritation or dryness associated with various nasal conditions, minimize mucosal atrophy, and dislodge encrusted or thickened mucus, while causing no side effects, and may be used freely in pregnant patients. In addition, if used immediately before intra-nasal corticosteroid dosing, saline helps prevent local irritation. Anti-histamines often serve as a primary therapy. Terfenadine and astemizole, two non-sedating anti-histamines, however, have been associated with a ventricular arrhythmia known as Torsades de Points, usually in interaction with other medications such as ketoconazole and erythromycin, or secondary to an underlying cardiac problem. Up to date, loratadine, another non-sedating anti-histamine, and cetirizine have not been associated with

serious adverse cardiovascular events. Cetirizine's most common side effect, however, is drowsiness. Claritin, for example, may be effective in relieving sneezing, runny nose, and nasal, ocular and palatal itching in a low percentage of patients, although not approved for this indication or asthma. Anti-histamines are typically combined with a decongestant to help relieve nasal congestion. Sympathomimetic medications are used as vasoconstrictors and decongestants, the most common being pseudoephedrine, phenylpropanolamine and phenylephrine. These agents, however, often cause hypertension, palpitations, tachycardia, restlessness, insomnia and headache. Topical decongestants are recommended for limited periods because their overuse results in nasal dilatation. Anti-cholinergic agents, such as cromolyn, have a role in patients with significant rhinorrhea or in specific cases, such as "gustatory rhinitis", which is usually associated with ingestion of spicy foods, and have been used on the common cold. Sometimes the Cromolyn spray produces sneezing, transient headache, and even nasal burning. Topical and nasal spray corticosteroids such as Vancenase are effective agents in the treatment of rhinitis, especially for symptoms of congestion, sneezing and runny nose, but sometimes may cause irritation, stinging, burning, sneezing, and local bleeding. Topical steroids are generally more effective than Cromolyn sodium, particularly in the treatment of NARES, but side effects sometimes limit their usefulness. Immunotherapy, while expensive and inconvenient, often provides substantial benefits, especially the use of drugs such as blocking antibodies, and those that alter cellular histamine release, and result in decreased IgE. Presently available treatments, such as propranolol, verapamil, and adenosine, may help to minimize symptoms. Verapamil is most commonly used but it has several shortcomings, since it causes or exacerbates systemic hypotension, congestive heart failure, bradyarrhythmias, and ventricular fibrillation. Verapamil, however, crosses the placenta and has been shown to cause fetal bradycardia, heart block, depression of contractility, and hypotension. Adenosine has several advantages over verapamil, including rapid onset, brevity of side effects, theoretical safety, and probable lack of placental transfer, but may not be administered to a variety of patients.

Chronic obstructive pulmonary disease (COPD) is characterized by airflow obstruction that is generally caused by chronic bronchitis, emphysema, or both. Emphysema is characterized by abnormal permanent enlargement of the air spaces distal to the terminal bronchioles, accompanied by destruction of their walls and without obvious fibrosis. Chronic bronchitis is characterized by chronic cough, mucus production, or both, for at least three months for at least two successive years where other causes of chronic cough have been excluded. COPD characteristically affects middle aged and elderly people, and is one of the leading causes of morbidity and mortality worldwide. In the United States it affects about 14 million people and is the fourth leading cause of death, and both its morbidity and mortality rates are still rising. This contrasts with the decline over the same period in age-adjusted mortality from all causes, and from cardiovascular diseases. COPD, however, is preventable, since it is believed that its main cause is exposure to cigarette smoke. The disease is rare in lifetime non-smokers, in whom exposure to environmental tobacco smoke will explain at least some of the airways obstruction. Other proposed etiological factors include airway hyper-responsiveness or hypersensitivity, ambient air pollution, and allergy. The airflow obstruction in COPD is usually progressive in people who continue to smoke. This results in early disability and shortened survival time. Stopping smoking reverts the decline in lung function to values for non-smokers. Many patients will use medication chronically for the rest of their lives, with the need for increased doses and additional drugs during exacerbations. Amongst the currently available treatments for COPD, short-term benefits were found, as opposed to long term effects on progression, from anti-cholinergic drugs, β_2 adrenergic agonists, and oral steroids. The effects of anti-cholinergic drugs and β_2 adrenergic agonists, however, are not seen in all people with COPD, and the two agents combined are only slightly more effective than either alone. Their adverse effects and the need for frequent monitoring of blood concentrations limit the usefulness of theophyllines. There is no evidence that anti-cholinergic agents affect the decline in lung function, and mucolytics have been shown to reduce the frequency of exacerbations but with a possible deleterious effect on lung function. The long-term effects of β_2 adrenergic agonists, oral corticosteroids, and antibiotics have not yet been evaluated, and up to the present time no other drug has been shown to affect the progression of the disease or survival. Thus, there is very little currently available to alleviate symptoms of COPD, prevent exacerbations, preserve optimal lung function, and improve daily living activities and quality of life. Thus, there is very little currently available to alleviate symptoms of COPD, prevent exacerbations, preserve optimal lung function, and improve daily living activities and quality of life.

Interstitial lung disease (ILD), interstitial pulmonary fibrosis, or simply pulmonary fibrosis are terms that include more than 130 chronic lung disorders that affect the lung in at least three ways: lung tissue is damaged in some known or unknown way, walls of the air sacs in the lung become inflamed, and scarring or fibrosis begins in

the interstitium (or tissue between the air sacs), and the lung becomes stiff. Breathlessness during exercise may be one of the first symptoms of these diseases, and a dry cough may be present. Neither the symptoms nor X rays are often sufficient to tell apart different types of pulmonary fibrosis. Some pulmonary fibrosis patients have known causes and some have unknown or idiopathic causes. Interstitial lung disease (or pulmonary fibrosis) is named after
5 he tissue between the air sacs of the lungs because this is the tissue affected by fibrosis or scarring. The course of this disease is generally unpredictable. If they progress the lung tissue thickens and becomes stiff, breathing becomes more difficult and demanding, and inflammation occurs. Some people may need oxygen therapy as part of their treatment.

Microbial infections are extremely common, and may be caused by viruses, bacteria, and other forms of
10 life. They are generally treated with anti-viral agents, antibiotics, and other specific therapeutic drugs. However, some infectious may either go unnoticed, or produce secondary effects such as inflammation, pulmonary and airway obstructions, and other pulmonary ailments.

Cancer is one of the most prevalent and feared diseases of our times. It generally results from the carcinogenic transformation of normal cells of different epithelia. Two of the most damaging characteristics of
15 carcinomas and other types of malignancies are their uncontrolled growth and their ability to create metastases in distant sites of the host, particularly a human host. It is usually these distant metastases that cause serious consequences to the host, since frequently the primary carcinoma may be, in most cases, removed by surgery. The treatment of cancer presently relies on surgery, irradiation therapy and systemic therapies such as chemotherapy, different immunity-boosting medicines and procedures, hyperthermia and systemic, radioactively labeled monoclonal antibody treatment,
20 immunotoxins and chemotherapeutic drugs.

Adenosine may constitute an important mediator in the lung for various diseases, including bronchial asthma, COPD, CF, RDS, rhinitis, pulmonary fibrosis, and others. Its potential role was suggested by the finding that asthmatics respond favorably to aerosolized adenosine with marked bronchoconstriction whereas normal
25 individuals do not. An asthmatic rabbit animal model, the dust mite allergic rabbit model for human asthma, responded in a similar fashion to aerosolized adenosine with marked bronchoconstriction whereas non-asthmatic rabbits showed no response. More recent work with this animal model suggested that adenosine-induced bronchoconstriction and bronchial hyperresponsiveness in asthma may be mediated primarily through the stimulation of adenosine receptors. Adenosine has also been shown to cause adverse effects, including death, when administered therapeutically for other diseases and conditions in subjects with previously undiagnosed hyper
30 reactive airways.

Adenosine is a purine involved in intermediary metabolism, and may constitute an important natural mediator of many of diseases. Adenosine plays a unique role in the body as a regulator of cellular metabolism. It can raise the cellular level of AMP, ADP and ATP which are the energy intermediates of the cell. Adenosine can
35 stimulate or down regulate the activity of adenylate cyclase and hence regulate cAMP levels. cAMP, in turn, plays a role in neurotransmitter release, cellular division and hormone release. Adenosine's major role appears to be to act as a protective injury autocoid. In any condition in which ischemia, low oxygen tension or trauma occurs adenosine appears to play a role. Defects in synthesis, release, action and/or degradation of adenosine have been postulated to contribute to the over activity of the brain excitatory amino acid neurotransmitters, and hence various pathological states. Adenosine has also been implicated as a primary determinant underlying the symptoms of bronchial asthma
40 and other respiratory diseases, the induction of bronchoconstriction and the contraction of airway smooth muscle. Moreover, adenosine causes bronchoconstriction in asthmatics but not in non-asthmatics. Other data suggest the possibility that adenosine receptors may also be involved in allergic and inflammatory responses by reducing the hyperactivity of the central dopaminergic system. It has been postulated that the modulation of signal transduction at the surface of inflammatory cells influences acute inflammation. Adenosine is said to inhibit the production of
45 super-oxide by stimulated neutrophils. Recent evidence suggests that adenosine may also play a protective role in stroke, CNS trauma, epilepsy, ischemic heart disease, coronary by-pass, radiation exposure and inflammation. Overall, adenosine appears to regulate cellular metabolism through ATP, to act as a carrier for methionine, to decrease cellular oxygen demand and to protect cells from ischemic injury. Adenosine is a tissue hormone or inter-cellular messenger that is released when cells are subject to ischemia, hypoxia, cellular stress, and increased
50 workload, and or when the demand for ATP exceeds its supply. Adenosine is a purine and its formation is directly linked to ATP catabolism. It appears to modulate an array of physiological processes including vascular tone, hormone action, neural function, platelet aggregation and lymphocyte differentiation. It also may play a role in

DNA formation, ATP biosynthesis and general intermediary metabolism. It is suggested that it regulates the formation of cAMP in the brain and in a variety of peripheral tissues. Adenosine regulates cAMP formation through two receptors A_1 and A_2 . Via A_1 receptors, adenosine reduces adenylate cyclase activity, while it stimulates adenylate cyclase at A_2 receptors. The adenosine A_1 receptors are more sensitive to adenosine than the A_2 receptors.

- 5 The CNS effects of adenosine are generally believed to be A_1 -receptor mediated, where as the peripheral effects such as hypotension, bradycardia, are said to be A_2 receptor mediated.

Anti-sense oligonucleotides have received considerable theoretical consideration as potential useful pharmacological agents in human disease. One important impediment to their effective application has been a difficulty in finding an appropriate route of administration to deliver them to their site of action. The administering
10 of anti-sense oligonucleotides directly to specific regions of the brain, for example, necessarily has limited clinical utility due to its invasive nature. Finding practical and effective applications for these agents in actual models of human disease have been few and far between, particularly because they had to be administered in large doses. The systemic administration of anti-sense oligonucleotides as pharmacological agents, such as oral and parenteral administration, has been found to have also significant problems, including the inherent difficulty in targeting
15 specific tissues due to their dilution in the circulatory system. The bioavailability of orally administered anti-sense oligonucleotides is very low, of the order of less than about 5%. The present inventor previously pioneered the administration of oligonucleotides via the respiratory system, and successfully treated asthma, bronchoconstriction and lung inflammation and allergies, and applied the technology to the treatment of other conditions. The route of administration, thus was found to be of importance, particularly for treating localized conditions. As described in
20 more detail below, the lung is an excellent target for the direct administration of anti-sense oligonucleotides and provides a non-invasive and a tissue-specific route. The respiratory system, and in particular the lung, as the ultimate port of entry into the organism provides an excellent route of administration for anti-sense oligonucleotides. This is so not only for the treatment of lung disease, but also when utilizing the lung as a means for delivery, particularly because of its non-invasive and tissue-specific nature. Thus, local delivery of anti-sense oligos directly
25 to the target tissue enables an optimal delivery for the therapeutic use of these compounds. Fomivirsen (ISIS 2922) is an example of a local drug delivery into the eye to treat cytomegalovirus (CMV) retinitis, for which a new drug application has been filed by ISIS. The administration of a drug through the lung offers the further advantage that inhalation is non-invasive whereas direct injection into the vitreous of the eye is invasive.

Steroids are naturally occurring compounds of varied activities. In mammals, they serve different functions,
30 some being associated with sexual cycles and reproduction, others with regulation of endogenous levels of various compounds. Some of these have anti-inflammatory activity,

Steroid hormones are potent chemical messengers that exert dramatic effects on cell differentiation, homeostasis, and morphogenesis. These molecules diverse in structure share a mechanistically similar mode of action. The effector molecules diffuse across cellular membranes and bind to specific high affinity receptors in the
35 target cell nuclei. This interaction results in the conversion of an inactive receptor to one that can interact with the regulatory regions of target genes and modulate the rate of transcription of specific gene sets. Upon ligand binding, these receptors generate both rapid and long lasting responses. Steroids can act through two basic mechanisms: genomic and non-genomic. The classical genomic action is mediated by specific intracellular receptors, whereas the primary target for the non-genomic one is the cell membrane. Many clinical symptoms seem to be mediated
40 through the non-genomic route. Furthermore, membrane effects of steroid and other factors can interfere with the intranuclear receptor system inducing or repressing steroid-and receptor-specific genomic effects. These signalling pathways may lead to unexpected hormonal or anti-hormonal effects in patients treated with certain drugs.

Steroid receptors are members of a large family of nuclear transcription factors that regulate gene expression by binding to their cognate steroid ligands, to the specific enhancer sequences of DNA (steroid response
45 elements) and to the basic transcription machinery. Steroid receptors are basically localized in the nucleus, regardless of hormonal status, and considerable amounts of unliganded steroid receptors may be present in the cytoplasm of target cells in exceptional cases. Most steroid receptors are phosphoproteins, which are further phosphorylated after ligand binding. The role of phosphorylation in receptor transaction is complex and may not be uniform to all steroid receptors. However, phosphorylation and/or dephosphorylation is believed to be a key event
50 regulating the transcriptional activity of steroid receptors. Steroid receptor activities can be affected by the amount of steroid receptor in the cell nuclei, which is modified by the rate of transcription and translation of the steroid receptor gene as well as by proteolysis of the steroid receptor protein. There is an auto- and heteroregulation of

receptor levels. Some of the steroid receptors appear to bind specific protease inhibitors and exhibit protease activity. Some steroid receptors are expressed as two or more isoforms, which may have different effects on transcription. Receptor isoforms are different translation or transcription products of a single gene. Isoform A of the progesterone receptor is a truncated form of PR isoform B originating from the same gene, but it is able to suppress not only the gene enhancing activity of PR-B but also that of other steroid receptors.

Before hormone binding, the receptors are part of a complex with multiple chaperones which maintain the receptor in its steroid binding conformation. Following hormone binding, the complex dissociates and the receptors bind to steroid response elements in chromatin. Regulation of gene expression by hormones involves an interaction of the DNA-bound receptors with other sequence-specific transcription factors and with the general transcription factors, which is partly mediated by co-activators and co-repressors. The specific array of cis regulatory elements in a particular promoter/enhancer region, as well as the organization of the DNA sequences in nucleosomes, specifies the network of receptor interactions. Depending on the nature of these interactions, the final outcome can be induction or repression of transcription.

Adrenocortical hormones are steroid hormones classified as glucocorticoids, mineralocorticoids and sex hormones. Glucocorticoids moderate the metabolism of sugar, fat and protein and may raise the resistance to the adverse stimulation of the body by these substances. Many of the clinically useful steroids belong to this group, including cortisone, hydrocortisone, and their pharmaceutical derivatives such as prednisone, dexamethasone, etc. Although glucocorticoids were originally so called because of their influence on glucose metabolism, they are currently defined as steroids that exert their effects by binding to specific cytosolic receptors that mediate the actions of these hormones. These glucocorticoid receptors are present in virtually all tissues, and glucocorticoid-receptor interactions are responsible for most of the known effects of these steroids. Alteration in the structure of these glucocorticoids has led to the development of synthetic compounds with greater glucocorticoid activity. The increased activity of these compounds is due to increased affinity for the glucocorticoid receptors and/or delayed plasma clearance, which increases tissue exposure. In addition, many of these synthetic glucocorticoids evidence negligible mineralocorticoid effects and thus do not result in sodium retention, hypertension, and/or hypokalemia. Glucocorticoid action is initiated by entry of the steroid into the cell and binding to the cytosolic glucocorticoid receptor proteins. After binding, activated hormone-receptor complexes enter the nucleus and interact with nuclear chromatin acceptor sites. These events cause the expression of specific genes and the transcription of specific mRNAs. The resulting proteins affect the response to the glucocorticoids, which may be inhibitory or stimulatory depending on the specific tissue affected. Although glucocorticoid receptors are similar in many tissues, the proteins synthesized vary widely and are the result of expression of specific genes in different cell types.

Mineralocorticoids and sex hormones are non-glucocorticoid steroids, e.g., adrenal androgens. Adrenal androgens, such as androstenediones, dehydroepiandrosterone (DHEA), and DHEA sulfate function as precursors for the peripheral conversion to androgenic hormones, such as testosterone and dihydrotestosterone. DHEA sulfate secreted by the adrenal undergoes limited conversion to DHEA, and both the peripheral DHEA and DHEA secreted by the adrenal cortex may be further converted in peripheral tissues to androstenedione, the immediate precursor of the active androgens. Dehydroepiandrosterone (DHEA) is a naturally occurring steroid secreted by the adrenal cortex with apparent chemoprotective properties. Epidemiological studies have shown that low endogenous levels of DHEA correlate with increased risk of developing some forms of cancer, such as pre-menopausal breast cancer in women and bladder cancer in both sexes. The ability of DHEA and DHEA analogues, e.g. dehydroepiandrosterone sulfate (DHEA-S), to inhibit carcinogenesis is believed to result from their uncompetitive inhibition of the activity of the enzyme glucose 6-phosphate dehydrogenase (G6PDH). G6PDH is the rate limiting enzyme of the hexose monophosphate pathway, a major source of intracellular ribose-5-phosphate and NADPH. Ribose-5 phosphate is a necessary substrate for the synthesis of both ribo- and deoxyribonucleotides required for the synthesis of RNA and DNA. NADPH is a cofactor also involved in nucleic acid biosynthesis and the synthesis of hydroxymethylglutaryl Coenzyme A reductase (HMG CoA reductase). HMG CoA reductase is an unusual enzyme that requires two moles of NADPH for each mole of product, mevalonate, produced. Thus, it appears that HMG CoA reductase would be ultrasensitive to DHEA-mediated NADPH depletion, and that DHEA-treated cells would rapidly show the depletion of intracellular pools of mevalonate. Mevalonate is required for DNA synthesis, and DHEA arrests human cells in the G1 phase of the cell cycle in a manner closely resembling that of the direct HMG CoA. Because G6PDH produces mevalonic acid used in cellular processes such as protein isoprenylation and the synthesis of dolichol, a precursor for glycoprotein biosynthesis, DHEA inhibits carcinogenesis by depleting mevalonic acid and thereby

inhibiting protein isoprenylation and glycoprotein synthesis. Mevalonate is a central precursor for the synthesis of cholesterol, as well as for the synthesis of a variety of non-sterol compounds involved in post-translational modification of proteins, such as farnesyl pyrophosphate and geranyl pyrophosphate. Mevalonate is also a central precursor for the synthesis of dolichol, a compound that is required for the synthesis of glycoproteins involved in cell-to-cell communication and cell structure. Mevalonate is also central to the manufacture of ubiquinone, an antioxidant with an established role in cellular respiration. It has long been known that patients receiving steroid hormones of adrenocortical origin at pharmacologically appropriate doses show increased incidence of infectious disease.

DHEA, also known as 3β -hydroxyandrost-5-en-17-one or dehydroepiandrosterone, is a 17-ketosteroid which is quantitatively one of the major adrenocortical steroid hormones found in mammals. Although DHEA appears to serve as an intermediary in gonadal steroid synthesis, the primary physiological function of DHEA has not been fully understood. It has been known, however, that levels of this hormone begin to decline in the second decade of life, reaching 5% of the original level in the elderly.) Clinically, DHEA has been used systemically and/or topically for treating patients suffering from psoriasis, gout, hyperlipemia, and it has been administered to post-coronary patients. In mammals, DHEA has been shown to have weight optimizing and anti-carcinogenic effects, and it has been used clinically in Europe in conjunction with estrogen as an agent to reverse menopausal symptoms and also has been used in the treatment of manic depression, schizophrenia, and Alzheimer's disease. DHEA has also been used clinically at 40 mg/kg/day in the treatment of advanced cancer and multiple sclerosis. Mild androgenic effects, hirsutism, and increased libido were the side effects observed. These side effects can be overcome by monitoring the dose and/or by using analogues. The subcutaneous or oral administration of DHEA to improve the host's response to infections is known, as is the use of a patch to deliver DHEA. DHEA is also known as a precursor in a metabolic pathway that ultimately leads to more powerful agents that increase immune response in mammals. That is, DHEA acts as a biphasic compound: it acts as an immuno-modulator when converted to androstenediol or androst-5-ene- 3β , 17β -diol (β AED), or androstenediol or androst-5-ene- 3β , 7β , 17β -triol (β AET). However, in vitro DHEA has certain lymphotoxic and suppressive effects on cell proliferation prior to its conversion to β AED and/or β AET. It is, therefore, believed that the superior immunity enhancing properties obtained by administration of DHEA result from its conversion to more active metabolites.

Adequate ubiquinone levels have been found to be essential for maintaining proper cardiac function, and the administration of exogenous ubiquinone has recently been shown to have beneficial effect in patients with chronic heart failure. Ubiquinone depletion has been observed in humans and animals treated with lovastatin, a direct HMG CoA reductase inhibitor. Such lovastatin-induced depletion of ubiquinone has been shown to lead to chronic heart failure, or to a shift from low heart failure into life-threatening high grade heart failure. DHEA, unlike lovastatin, inhibits HMG CoA reductase indirectly by inhibiting G6PDH and depleting NADPH, a required cofactor for HMG CoA reductase. However, DHEA's indirect inhibition of HMG CoA reductase suffices to deplete intracellular mevalonate. This effect adds to the depletion of ubiquinone, and may result in chronic heart failure following long term usage. Thus, although DHEA was once considered a safe drug, it is now predicted that with long term administration of DHEA or its analogues, chronic heart failure may occur as a complicating side effect. Further, some analogues of DHEA produce this side effect to a greater extent because, in general, they are more potent inhibitors of G6PDH than DHEA.

A handful of medicaments have been used for the treatment of respiratory diseases and conditions, although in general they all have limitations. Amongst them are corticoid steroids with glucocorticoid activity, leukotriene inhibitors, anti-cholinergic agents, anti-histamines, oxygen therapy, theophyllines, and mucolytics. Corticosteroids are the ones with the most widespread use in spite of their well documented side effects. Most of the available drugs are nevertheless effective in a small number of cases, and not at all when it comes to the treatment of asthma. No treatments are currently available for many of the other respiratory diseases. Theophylline, an important drug in the treatment of asthma, is a known adenosine receptor antagonist that was reported to eliminate adenosine-mediated bronchoconstriction in asthmatic rabbits. A selective adenosine A_1 receptor antagonist, 8-cyclopentyl-1, 3-dipropylxanthine (DPCPX) was also reported to inhibit adenosine-mediated bronchoconstriction and bronchial hyperresponsiveness in allergic rabbits. The therapeutic and preventative applications of currently available adenosine A_1 receptor-specific antagonists are, nevertheless, limited by their toxicity. Theophylline, for example, has been widely used in the treatment of asthma, but is associated with frequent, significant toxicity resulting from its narrow therapeutic dose range. DPCPX is far too toxic to be useful clinically. The fact that, despite decades of

extensive research, no specific adenosine receptor antagonist is available for clinical use attests to the general toxicity of these agents.

For many years, two classes of compounds have dominated the treatment of asthma: corticosteroids having glucocorticoid activity and bronchodilators. Examples of corticosteroids are beclomethasone and corticoid 21-sulfopropionates. Examples of a bronchodilator are an older β_2 adrenergic agonist such as albuterol, and a newer one such as salmeterol. In general, when glucocorticosteroids are taken daily either by inhalation or orally, they attenuate inflammation. The β_2 adrenergic agonists, on the other hand, primarily alleviate bronchoconstriction. Whereas glucocorticosteroids are not useful in general for acute settings, bronchodilators are used in acute care, such as in the case of asthma attacks. At the present time, many asthma patients require daily use of both types of agents, a glucocorticosteroid to contain pulmonary inflammation, and a bronchodilator to alleviate bronchoconstriction. More recently, fluticasone propionate, a corticosteroid was combined with β_2 adrenergic agonists in one therapeutic formulation said to have greater efficiency in the treatment of asthma. However, glucocorticosteroids, particularly when taken for prolonged periods, have extremely deleterious side effects that, although somewhat effective, make their chronic use undesirable, particularly in children.

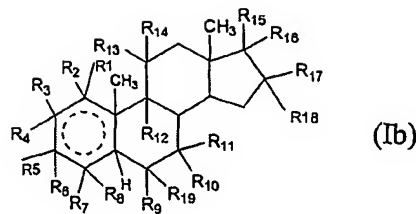
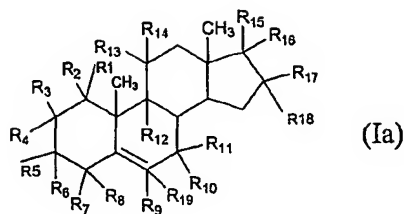
Clearly, there exists a well defined need for novel and effective therapies for treating respiratory, lung and cancer ailments that cannot presently be reasonably treated, or at least for which no therapies are available that are effective and devoid of significant detrimental side effects. Moreover, there is a definite need for treatments that have prophylactic and therapeutic applications, and require low amounts of active agents, and are less costly and less prone to detrimental side effects. Furthermore, it is readily apparent that anti-inflammatory steroids ("AIS"), including adrenal androgens, androgens and their derivatives, etc, corticoid and non-glucocorticoid steroids, ubiquinones and their respective salts, as well as specifically targeted anti-sense oligonucleotides (oligos) are each alone useful for the treatment of respiratory, lung, and cancer. This patent provides their joint effects that evidence unexpected superior results over each agent alone.

SUMMARY OF THE INVENTION

The present invention generally relates to a pharmaceutical or veterinary composition, comprising a pharmaceutically or veterinarily acceptable carrier or diluent, and first and second active agents.

The first active agent comprises an oligonucleotide(s) (oligo(s)) that may be anti-sense to one or more targets, and a second active agent comprising anti-inflammatory steroids ("AIS") and/or a ubiquinone, in amounts effective for alleviating airway, lung, and microbial and/or cancer diseases associated with, for example, bronchoconstriction, impeded respiration, dyspnea, emphysema, asthma, COPD, ARDS, CF, allergic rhinitis, pulmonary hypertension and fibrosis, lung inflammation, allergies, surfactant depletion or hyposecretion, and cancers, among others. The oligo preferably contains about 0 to about 15% adenosine (A) and is anti-sense to the initiation codon, the coding region, the 5'-end or the 3'-end genomic flanking regions, the 5' or 3' intron-exon junctions, or regions within 2 to 10 nucleotides of the junctions of at least one gene regulating or encoding a target polypeptide associated with lung or airway dysfunction or cancer, or that is anti-sense to the corresponding mRNA, and the composition may comprise also combinations or mixtures of the oligos. The targets are typically molecules associated with airway disease, cancer, etc., such as transcription factors, stimulating and activating peptide factors, cytokines, cytokine receptors, chemokines, chemokine receptors, adenosine receptors, bradykinin receptors, endogenously produced specific and non-specific enzymes, immunoglobulins and antibodies, antibody receptors, central nervous system (CNS) and peripheral nervous and non-nervous system receptors, CNS and peripheral nervous and non-nervous system peptide transmitters, adhesion molecules, defensins, growth factors, vasoactive peptides and receptors, binding proteins, and malignancy associated proteins, among others. In one embodiment the first active agent comprises a nucleic acid wherein the oligo is anti-sense to more than one target. These are called within the four corners of this patent multiple target anti-sense oligonucleotides or MTAs.

The second active agent comprises an anti-inflammatory steroid such as an adrenal androgen of the chemical formula

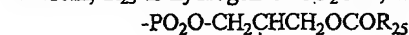


or

- wherein $R_1, R_2, R_3, R_4, R_6, R_7, R_8, R_9, R_{10}, R_{12}, R_{13}, R_{14}$ and R_{19} are independently H, OR, halogen, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkene, (C_1-C_{10}) alkyne, (C_1-C_{10}) alkoxy, or two or more of $R_1, R_2, R_3, R_4, R_6, R_7, R_8, R_9, R_{10}, R_{12}, R_{13}, R_{14}$ and R_{19} can be linked by combination of the atoms of C, O, N, S, P and Si to form a 3 to 15 member ring(s), in the α - and/or β - configuration;

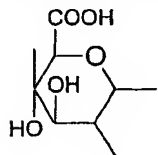
- R_5, R_6, R_{10} , and R_{11} are independently OH, SH, H, halogen, pharmaceutically acceptable ester, pharmaceutically acceptable thioester, pharmaceutically acceptable ether, pharmaceutically acceptable thioether, pharmaceutically acceptable inorganic esters, pharmaceutically acceptable monosaccharide, disaccharide or oligosaccharide, spirooxirane, spirothirane, $-OSO_2R_{20}$, $-OPOR_{20}R_{21}$, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkene, (C_1-C_{10}) alkyne or OR_{23} ,
 $-SO_2O-CH_2CHCH_2OCOR_{25}$

wherein, R_{23} is hydrogen or SO_2OM , wherein M is selected from H, Na, sulfatide;



phosphatide

, wherein R_{24} and R_{25} , which may be the same or different, are straight or branched (C_1-C_{20}) alkyl, (C_1-C_{20}) alkene, (C_1-C_{20}) alkyne, sugar, polyethyleneglycol (PEG) or glucuronide



15

R_5 and R_6 taken together are $=O$;

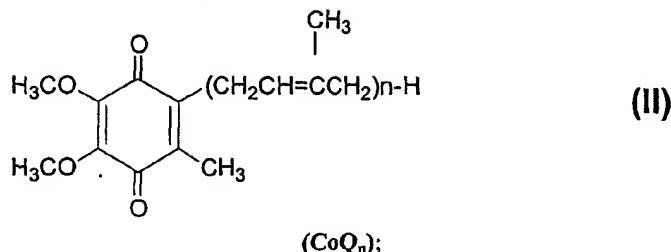
R_{10} and R_{11} taken together are $=O$;

- R_{15} is (1) H, halogen, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkene, (C_1-C_{10}) alkyne, or (C_1-C_{10}) alkoxy when R_{16} is $-C(O)OR_{22}$, (2) H, halogen, OH, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkene or (C_1-C_{10}) alkyne, when R_{16} is halogen, OH, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkene or (C_1-C_{10}) alkyne, (3) H, halogen, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkenyl, (C_1-C_{10}) alkynyl, formyl, (C_1-C_{10}) alkanoyl or epoxy when R_{16} is OH, (4) OR, SR, SH, H, halogen, pharmaceutically acceptable ester, pharmaceutically acceptable thioester, pharmaceutically acceptable ether, pharmaceutically acceptable thioether, pharmaceutically acceptable inorganic esters, pharmaceutically acceptable monosaccharide, disaccharide or oligosaccharide, spirooxirane, spirothirane, $-OSO_2R_{20}$ or $-OPOR_{20}R_{21}$ when R_{16} is H, or R_{15} and R_{16} taken together are $=O$;

- R_{17} and R_{18} are independently (1) H, $-OH$, halogen, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkene, (C_1-C_{10}) alkyne or $-(C_1-C_{10})$ alkoxy when R_6 is H OR, halogen, (C_1-C_{10}) alkyl or $-C(O)OR_{22}$, (2) H, (C_1-C_{10}) alkyl $_n$ amino, (C_1-C_{10}) alkene $_n$ amino, (C_1-C_{10}) alkyne $_n$ amino, $((C_1-C_{10})$ alkyl) $_n$ amino- (C_1-C_{10}) alkyl, $((C_1-C_{10})$ alkene) $_n$ amino- (C_1-C_{10}) alkyl, $((C_1-C_{10})$ alkyne) $_n$ amino- (C_1-C_{10}) alkyl, $((C_1-C_{10})$ alkyl) $_n$ amino- (C_1-C_{10}) alkene, $((C_1-C_{10})$ alkene) $_n$ amino- (C_1-C_{10}) alkene, $((C_1-C_{10})$ alkyne) $_n$ amino- (C_1-C_{10}) alkene, $((C_1-C_{10})$ alkyl) $_n$ amino- (C_1-C_{10}) alkyne, $((C_1-C_{10})$ alkene) $_n$ amino- (C_1-C_{10}) alkyne, $((C_1-C_{10})$ alkyne) $_n$ amino- (C_1-C_{10}) alkyne, (C_1-C_{10}) alkoxy, hydroxy - (C_1-C_{10}) alkyl, hydroxy - (C_1-C_{10}) alkene, hydroxy - (C_1-C_{10}) alkyne, (C_1-C_{10}) alkoxy - (C_1-C_{10}) alkyl, (C_1-C_{10}) alkoxy - (C_1-C_{10}) alkene, (C_1-C_{10}) alkoxy - (C_1-C_{10}) alkyne, $(halogen)_m$ (C_1-C_{10}) alkyl, $(halogen)_m$ (C_1-C_{10}) alkene, $(halogen)_m$ (C_1-C_{10}) alkyne, (C_1-C_{10}) alkanoyl, formyl, (C_1-C_{10}) carbalkoxy or (C_1-C_{10}) alkanoyloxy when R_{15} and R_{16} taken together are $=O$, (3) R_{17} and R_{18} taken together are $=O$; (4) R_{17} and R_{18} taken together with the carbon to which they are attached form a 3-6 member ring containing 0 or 1 oxygen atom; or (5) R_{15} and R_{17} taken together with the carbons to which they are

attached form an epoxide ring; R_{20} and R_{21} are independently OH, pharmaceutically acceptable ester or pharmaceutically acceptable ether; R_{22} is H, (halogen) $_m$ (C₁-C₁₀) alkyl, (halogen) $_m$ (C₁-C₁₀) alkene, (halogen) $_m$ (C₁-C₁₀) alkyne, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene or (C₁-C₁₀) alkyne; n is 0, 1 or 2; and m is 1, 2 or 3,

- 5 or pharmaceutically or veterinarily acceptable salts thereof; and/or
a ubiquinone of the chemical formula



- wherein n=1 to 12, the agent being present in an amount effective for treating respiratory lung diseases and conditions, or for reducing levels of, or sensitivity to, adenosine or for increasing surfactant or ubiquinone levels in a subject's tissue (s), or pharmaceutically acceptable salts thereof.

- The oligos and the anti-inflammatory steroids ("AIS") and/or ubiquinones (the second agent) are provided in the form of separate compositions and formulations together with a carrier or diluent, and optionally with other therapeutic agents and formulation additives. The first and second active agents are also provided as a single composition in combination with a carrier and other ingredients known in the art, and may be provided jointly or separately contained in a capsule or cartridge, and in the form of a kit. The drawings accompanying this patent form part of the disclosure of the invention, and further illustrate some aspects of the present invention as discussed below.

20 BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates the inhibition of HT-29 SF cells by DHEA.

Figures 2A and 2B illustrate the effects of different amounts of DHEA on cell cycle distribution in HT-29 SF cells.

- Figures 3A and 3B illustrate the reversal of DHEA-induced growth inhibition in HT-29 cells treated with
25 CON: Control; MVA: Mevalonic Acid; SQ: Squaline; CH: Cholesterol; DN: Deoxyribonucleosides; RN: Ribonucleosides.

Figures 4A, 4B, 4C and 4D illustrate the reversal of DHEA-induced G1 arrest in HT-29 SF cells for different durations of treatment with DHEA.

- The invention will now be described in general in conceptual and experimental terms, with reference to
30 specific examples. Other objects, advantages and features of the present invention will become apparent to those skilled in the art from the description that follows.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

- This invention arose from a desire by the inventor to improve on his own prior treatments and those of others for diseases of the respiratory and pulmonary tracts, as well as those that develop elsewhere in the mammalian
35 body. While he previously provided a pioneering treatment for respiratory tract conditions employing oligonucleotide anti-sense to pre-selected targets, and a treatment for respiratory conditions employing dehydroepiandrosterones and ubiquinone, he reasoned further that their combination might produce unexpectedly superior results given their independent mechanisms. Moreover, he posited that the combination of low dose anti-sense oligonucleotide (oligo) therapy with steroids in general and/or ubiquinone therapy would afford the advantage
40 of their independent lack of detrimental side effects when compared with other agents such as steroids alone, and many others that are generally fraught with detrimental side effects and by the need of administering high doses of therapeutical agents. The inventor's prior discovery that variously targeted anti-sense oligonucleotides (oligos) may be utilized therapeutically in the treatment of diseases or conditions which impair respiration, cause inflammation and/or allergy(ies) in the lung and elsewhere, constrict bronchial tissue, obstruct lung airways, deplete surfactant

secretion, and/or otherwise impede normal breathing, lead him to expand his work to their combination with steroids of broad classifications, whose association, either known or discovered by him, with respiratory and pulmonary diseases as well as heart, brain, kidney, skin and other conditions, e.g. ailments associated with hypoxia, infantile Respiratory Disorder Syndrome (RDS), Acute Respiratory Disorder Syndrome (ARDS), aging, cardiac disease, cardiovascular problems, asthma, respiratory distress syndrome, rhinitis, pain, cystic fibrosis (CF), pulmonary hypertension, pulmonary vasoconstriction, pulmonary fibrosis, emphysema, chronic obstructive pulmonary disease (COPD), allergic rhinitis, and cancers such as lung cancer, leukemias, lymphomas, carcinomas, and the like, including colon cancer, breast cancer, lung cancer, pancreatic cancer, hepatocellular carcinoma, kidney cancer, melanoma, etc., as well as all types of cancers which may metastasize or have metastasized to the lung(s), including breast, liver and prostate cancer, would clearly find an immediate therapeutic application. In general, many diseases and conditions are associated with or cause inflammation, constricted bronchial tissue or lung airways, depletion of surfactant secretion, or augmented respiratory tract allergy(ies), or otherwise impede normal breathing.

The present treatment employs two agents, the first agent being selective for specific targets associated with or mediating these symptoms, and when administered into the airways it is employed in doses up to 1000-fold lower than previously seen in the art. The other agent includes a steroid agent and/or a ubiquinone and provides a more generalized amelioration of the symptoms, also in the substantial absence of undesirable side effects. This treatment further improves on the inventor's prior separate oligonucleotide (oligo) treatment by selecting oligos of reduced adenosine content, or otherwise reducing their adenosine content to reduce the release of free adenosine (A) by breakdown of A-containing oligonucleotides (oligos), thereby avoiding activating adenosine receptors that aggravate bronchoconstriction, and respiratory tract inflammation and allergies, lung surfactant depletion, and the like. As further described below, this patent also provides for the substitution of other bases with a universal base(s) (U) when some characteristic is to be modified. This patent provides novel and improved compositions, formulations, kits and methods which afford greatly improved results when compared with previously known independent treatments for preventing and alleviating bronchoconstriction, allergy(ies), inflammation, breathing difficulties, surfactant depletion and blockage of airways, as well as for preventing and alleviating other conditions and diseases which, directly or indirectly, affect the lung tissue. In different embodiments, one or more nucleic acids of the invention may be formulated for their administration alone or in combination with the steroid agents and/or ubiquinones, surfactant(s), a carrier, and/or other therapeutic agents and formulation agents known in the art. Similarly, the anti-inflammatory steroids and the ubiquinones may be formulated separately for separate administration, or with various formulation components, other therapeutic agents, and the like. By means of example, the steroids and ubiquinone may be administered once or twice daily whereas the oligo may only need be administered once weekly or biweekly.

The single or multiple active agent compositions of this invention are provided in a variety of systemic and topical formulations suitable for the delivery of anti-sense oligonucleotides (oligos) and anti-inflammatory steroids and/or ubiquinones by different routes as a fast means of starting treatment to address asthma and other pulmonary and respiratory tract diseases that may have a rapid onset, where a very low drug dosage is desirable. On the other hand, the oligos have long half-lives and may be administered as preventative of acute episodes, to significantly reduce emergency visits to a doctor or hospital, and as prophylactic maintenance treatment due to the high tolerability of the active agents for prolonged periods of time. In one embodiment, the present treatment provides a once-a-week oligo therapy, accompanied by daily administration of ubiquinone and/or a steroid incorporated into a subject's daily routine. This regime may be effectively administered preventatively, prophylactically and therapeutically, in conjunction with other therapies, or by itself for conditions without known therapies or as a substitute for therapies that have significant negative side effects is also of immediate clinical application. The present treatment also finds an application in the treatment of malignancies, given that steroids and ubiquinones are known for their carcinogenic activities as well as beneficial respiratory effects.

In these cases, the oligo are targeted to cancer-associated nucleic acids and their products. General examples of oligo(s) of the invention are those targeted to a receptor(s) and it (they) are typically present in the composition in an amount effective to reduce that receptor(s) mediated effect(s), and for reducing airway obstruction, lung inflammation and allergy(ies), and surfactant depletion, among others. In one embodiment the receptor is preferably an adenosine receptor such as the adenosine A₁, A_{2b}, or A₃ receptors, and in some instances even adenosine A_{2a} receptors. The oligo of the invention may be applied to the preparation of a medicament for reducing bronchoconstriction, impeded respiration, lung inflammation and allergy(ies), depletion of surfactant or

ubiquinone, and for treating respiratory and pulmonary conditions in general, and specific ones such as asthma, ARDS, pulmonary fibrosis, cystic fibrosis, allergic rhinitis, COPD, etc. Many of the conditions targeted by the present treatment afflict a large segment of the population, and either remain unaddressed in terms of therapy or the existing treatments, although heavily advertised, are only mildly effective in small numbers of the afflicted population.

5 ARDS' most common symptoms are labored, rapid breathing, nasal flaring, cyanosis blue skin, lips and nails caused by lack of oxygen to the tissues, breathing difficulty, anxiety, stress, tension, joint stiffness, pain and temporarily absent breathing. In the following paragraphs, the specific conditions will be described, and the existing treatments, if any, discussed. ARDS is currently diagnosed by mere symptomatic signs, e. g. chest auscultation with a stethoscope that may reveal abnormal symptomatic breath sounds, and confirmed with chest X-rays and the
10 measurement of arterial blood gas. ARDS, in some instances, appears to be associated with other diseases, such as acute myelogenous leukemia, acute tumor lysis syndrome (ATLS) developed after treatment with, e.g. cytosine arabinoside, etc. In general, however, ARDS is associated with traumatic injury, severe blood infections such as sepsis or other systemic illness, high-dose radiation therapy and chemotherapy, and inflammatory responses which lead to multiple organ failure and in many cases death. In premature babies ("premies"), the lungs are not quite
15 developed and, therefore, the fetus is in an anoxic state during development. Moreover, lung surfactant, a material critical for normal respiration, is generally not yet present in sufficient amounts at this early stage of life; however, premies often hyper-express the adenosine A₁ receptor and/or underexpress the adenosine A_{2a} receptor and are, therefore, susceptible to respiratory problems including bronchoconstriction, lung inflammation and ARDS, among others. When Respiratory Distress Syndrome (RDS) occurs in premies, it is an extremely serious problem. Preterm
20 infants exhibiting RDS are currently treated by ventilation and administration of oxygen and surfactant preparations. When premies survive RDS, they frequently develop bronchopulmonary dysplasia (BPD), also called chronic lung disease of early infancy, which is often fatal.

Rhinitis may be seasonal or perennial, allergic or non-allergic. Non-allergic rhinitis may be induced by infections, such as viruses, or associated with nasal polyps, as occurs in patients with aspirin idiosyncrasy. Medical
25 conditions such as pregnancy or hypothyroidism and exposure to occupational factors or medications may cause rhinitis. The so-called NARES syndrome is a non-allergic type of rhinitis associated with eosinophils in the nasal secretions, which typically occurs in middle-age and is accompanied by some loss of sense of smell. When cholinergic pathways are stimulated they produce typical secretions that are identified by their glandular constituents so as to implicate neurologic stimulation. Other secretions typical of increased vascular permeability are found in
30 allergic reactions as well as upper respiratory infections, and the degranulation of mast cells releases preformed mediators that interact with various cells, blood vessels, and mucous glands, to produce the typical rhinitis symptoms. Most early- and late-phase reactions occur in the nose after allergen exposure. The late-phase reaction is seen in chronic allergic rhinitis, with hypersecretion and congestion as the most prominent symptoms. When priming occurs, it exhibits a lowered threshold to stimulus after repeated allergen exposure that, in turn, causes a
35 hypersensitivity reaction to one or more allergens. Sufferers may also become hyper-reactive to non-specific triggers such as cold air or strong odors. Saline sprays are generally used to relieve mucosal irritation or dryness associated with various nasal conditions, minimize mucosal atrophy, and dislodge encrusted or thickened mucus and are used immediately before intranasal corticosteroid dosing to prevent drug-induced local irritation. Anti-histamines such as terfenadine and astemizole, two non-sedating anti-histamines, are also employed to treat this condition, but have
40 been associated with a ventricular arrhythmia known as Torsades de Points, usually in interaction with other medications such as ketoconazole and erythromycin, or secondary to an underlying cardiac problem. Loratadine, another non-sedating anti-histamine, and cetirizine have not been associated with an adverse impact on the QT interval, or with serious adverse cardiovascular events. Cetirizine, however, produces extreme drowsiness and has not been widely prescribed. Non-sedating anti-histamines, e.g. Claritin have not been tested for asthma or other
45 more specific conditions. Terfenadine, loratadine and astemizole, on the other hand, exhibit extremely modest bronchodilating effects, reduction of bronchial hyper-reactivity to histamine, and protection against exercise- and antigen-induced bronchospasm. Some of these benefits, however, require higher-than-currently-recommended doses. The sedating-type anti-histamines help induce night sleep, but they cause sleepiness and compromise performance if taken during the day.

50 When employed, anti-histamines are typically combined with a decongestant to help relieve nasal congestion. Sympathomimetic medications are used as vasoconstrictors and decongestants. The three commonly prescribed systemic decongestants, pseudoephedrine, phenylpropanolamine and phenylephrine cause hypertension,

palpitations, tachycardia, restlessness, insomnia and headache. The interaction of phenylpropanolamine with caffeine, in doses of two to three cups of coffee, may significantly raise blood pressure. In addition, medications such as pseudoephedrine may cause hyperactivity in children. Topical decongestants, nevertheless, are only indicated for a limited period of time, as they are associated with a rebound nasal dilatation with overuse. Anti-cholinergic agents are given to patients with significant rhinorrhea or for specific conditions such as "gustatory rhinitis", usually caused by ingestion of spicy foods, and may have some beneficial effects on the common cold. Cromolyn used prophylactically as a nasal spray, however, produces sneezing, transient headache, and even nasal burning. Topical corticosteroids, such as Vancenase, are somewhat effective in the treatment of rhinitis, especially for symptoms of congestion, sneezing, and runny nose. Corticosteroid nose sprays, however, sometimes, cause irritation, stinging, burning and sneezing, and sometimes local bleeding and septal perforation. The side effects of topical steroids, however, limit their usefulness except for temporary therapy in patients with severe symptoms. These agents are sometimes used for shrinking nasal polyps when local therapy fails. Immunotherapy is expensive and inconvenient, and used mostly in in-patients who experience side effects from other medications. The so-called blocking antibodies, and agents that alter cellular histamine release, in addition, decrease IgE, which is useful in IgE-mediated diseases, e.g., hypersensitivity in atopic patients with recurrent middle ear infections. For allergic rhinitis sufferers, however, a runny nose is more than a nuisance. The disorder often results in impaired quality of life and sets the stage for more serious ailments, including psychological problems. Presently, rhinitis is mostly treated with propranolol, verapamil, and adenosine, all of which have Food and Drug Administration-approved labeling for acute termination of Supraventricular Tachycardia (SVT).

There is very little currently available to alleviate symptoms of COPD, prevent exacerbations, preserve optimal lung function, and improve daily living activities and quality of life. Anti-cholinergic drugs achieve short-term bronchodilation, but no improved long-term prognosis even with inhaled products. Most COPD patients have at least some airways obstruction, and "the lung health study" found spirometric signs of early COPD in men and women smokers. Smoking cessation produced a slowing of the decline in the functional effective volume of the lungs. While ipratropium bromide was found to have no significant effect on the decline in the functional effective volume of the patient's lungs. Ipratropium bromide, however, produced serious adverse effects, such as cardiac symptoms, hypertension, skin rashes, and urinary retention. Short and long acting inhaled β_2 adrenergic agonists achieve short-term bronchodilation and provide some symptomatic relief in COPD patients, but show no meaningful maintenance effect on its progression. Short acting β_2 adrenergic agonists increase exercise capacity and produce some degree of bronchodilation, and even increase lung function in some severe COPD cases. The maximum effectiveness of the newer long acting inhaled β_2 adrenergic agonists was found to be comparable to that of short acting β_2 adrenergic agonists. Salmeterol was found to produce modest or no change in lung function. In asthmatics, moreover, β_2 adrenergic agonists have been linked to an increased risk of death, worsened control of asthma, and deterioration in lung function.

Continuous treatment of asthmatic and COPD patients with the bronchodilators ipratropium bromide or fenoterol resulted in a decline in lung function, therefore indicating that they are not suitable for maintenance treatment. The most common immediate adverse effect of β_2 adrenergic agonists, however, is tremors, which at high doses may cause a fall in plasma potassium, dysrhythmias, and reduced arterial oxygen tension. The combination of a β_2 adrenergic agonist with an anti-cholinergic drug provides little additional bronchodilation compared with either drug alone. Theophyllines have a small bronchodilatory effect in COPD patients but common adverse effects, such as nausea, diarrhea, headache, irritability, seizures, and cardiac arrhythmias, that occur at highly variable blood concentrations and, in many people, within the therapeutic range. In addition, they have a small therapeutic range given that blood concentrations of 15-20 mg/l are required for optimal effects. The theophylline dose must be adjusted individually based on smoking habits, infection, and other treatments, which is cumbersome. No inflammatory response to theophyllines, however, has been reported in COPD. Oral corticosteroids show some improvement in baseline functional effective volume in stable COPD patients whereas systemic corticosteroids have been found to produce some degree of osteoporosis and overt diabetes. The longer term use of oral corticosteroids may be useful in COPD, but its usefulness must be weighed against their substantial adverse effects. Inhaled corticosteroids have been found to have no significant short-term effect in airway hyper-responsiveness to histamine, but a small long-term effect on lung function, e.g., in pre-bronchodilator functional effective volume. The treatment of COPD patients with fluticasone showed a significant reduction in moderate and severe exacerbations, and a small but significant improvement in lung function and six minute walking distance. Oral prednisolone, inhaled

beclomethasone or their combination had no effects in COPD patients, but lung function improved oral corticosteroids. Mucolytics have a modest effect on frequency and duration of exacerbations but an adverse effect on lung function. No mucolytics, however, have a significant effect in people with severe COPD. N-acetylcysteine, moreover, produced gastrointestinal side effects. Long-term oxygen therapy administered to hypoxaemic COPD and congestive cardiac failure patients, had little effect on death in men. In women, however, oxygen decreased the rates of death.

Although the progress and symptoms of pulmonary fibrosis and other ILDs may vary from person to person, they have one common link: they affect parts of the lung. The inflammation of the walls of the bronchioles (small airways), it is called bronchiolitis, and of the walls and air spaces of the alveoli (air sacs), it is called alveolitis. When the inflammation involves the small blood vessels (capillaries) of the lungs, it is called vasculitis. The inflammation may heal, or it may lead to permanent scarring of the lung tissue (pulmonary fibrosis). This latter results in permanent loss of the tissues ability to breathe and carry oxygen, and the amount of scarring determines the level of disability a person experiences due to destruction of the air sacs and lung tissue between and surrounding the air sacs and the lung capillaries. When this happens, oxygen is generally administered to help improve breathing. Pulmonary fibrosis is generally caused by occupational and environmental exposure to irritants such as asbestos, silica and metal dusts, bacteria and animal dusts, gases and fumes, asbestosis and silicosis, infections that produce lung scarring, e.g., tuberculosis, connective or collagen tissue diseases such as Rheumatoid Arthritis, Systemic Sclerosis and Systemic Lupus Erythematosus, Idiopathic Pulmonary Fibrosis, Pulmonary Fibrosis of genetic/familial origin, and certain medicines. Many of the diseases are often named after the occupations with which they are associated, such as Grain handler's lung, Mushroom worker's lung, Bagassosis, Detergent worker's lung, Maple bark stripper's lung, Malt worker's lung, Paprika splitter's lung, and Bird breeder's lung.

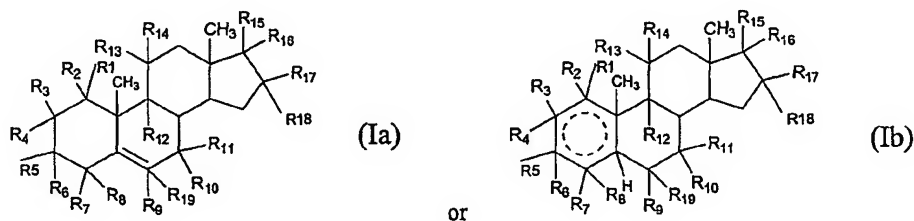
"Idiopathic" (of unknown origin) pulmonary fibrosis (IPF) is the label applied when all other causes of interstitial lung disease have been ruled out, and is said to be caused by viral illness and allergic or environmental exposure (including tobacco smoke). Bacteria and other microorganisms are not thought to be a cause of IPF. There is also a familial form of the disease, known as familial idiopathic pulmonary fibrosis whose main symptom is shortness of breath. Since many lung diseases show this symptom, making a correct diagnosis is often difficult. The shortness of breath may first appear during exercise and the condition may progress then to the point where any exertion is impossible. Eventually resulting in shortness of breath even at rest. Other symptoms may include a dry cough (without sputum), and clubbing of the fingertips. Glucocorticosteroids are usually administered to treat inflammation with inconclusive results. Other drugs are added when it is clear that the steroids are ineffective. Glucocorticosteroids are also used in combination with, for example, oxygen therapy in severe cases. Infection is prevented by administration of influenza and pneumococcal pneumonia vaccines. Lung biopsies are employed to assess the unpredictable response of patients to glucocorticosteroids or other immune system suppressants. Lung transplants are an ultimate option in severe cases of pulmonary fibrosis and other lung diseases. Pulmonary fibrosis may be caused by other specific diseases, such as sarcoidosis, a disease characterized by the formation of granulomas or areas of inflammatory cells, that may attack any organ of the body, most frequently the lungs, and shows enlarged lymph glands in the center of both lungs or lung tissue thickening. For many patients, sarcoidosis is a minor problem. Its symptoms including dry cough, shortness of breath, mild chest pain, fatigue, and weakness, and weight loss appears infrequently and stops even without medication. For others, it is a serious, disabling disease. Although almost everybody may develop the disease, it affects African-Americans more than members of any other race, most commonly young adults 20 to 40. Histiocytosis X, also associated with pulmonary fibrosis, seems to begin in the bronchioles or small airways of the lungs and their associated arteries and veins, and is generally followed by destruction of the bronchioles and narrowing and damaging of small blood vessels. Symptoms of this disease include a dry cough (without sputum), breathlessness upon exertion, and/or chest pain. In most cases the disease is chronic with loss of lung function, and glucocorticosteroid therapy is ineffective. Many histiocytosis X sufferers are current or former cigarette smokers mining workers, those exposed to asbestos or metal dusts or fibers, and agricultural workers exposed to particulate organic substances, such as moldy hay (Farmer's Lung). Asbestosis and silicosis are two occupational lung diseases whose causes are known. Asbestosis is caused by small needle-like particles of asbestos inhaled into the lungs that cause lung scarring or pulmonary fibrosis that may lead to lung cancer. Silicosis is a dust disease that comes from breathing in free crystalline silica dust, and is produced by all types of mining in which the ore, e. g. gold, lead, zinc, copper, iron, anthracite (hard) coal, and some bituminous (soft) coal, are extracted from quartz rock. Workers in foundries, sandstone grinding, tunneling, sandblasting,

concrete breaking, granite carving, and china manufacturing also inhaled tiny specks of silica that are carried down to the lung alveoli, where they lead to pulmonary fibrosis. There is no good therapy for this disease, but glucocorticosteroids alone, or combined drug therapy, and the hope of lung transplant are three treatments currently being tested. This patent provides the first effective therapy for these and other respiratory and lung ailments.

In the present context, the terms "adenosine, surfactant and ubiquinone depletion" are intended to encompass levels that are lowered or depleted in the subject as compared to previous levels in that subject, and levels, as well as levels in that subject but, because of some other reason, a therapeutic benefit would be achieved in the patient by modification of the levels of these agents as compared to previous levels.

The present invention, thus, provides a pharmaceutical or veterinary composition, comprising a pharmaceutically or veterinarily acceptable carrier or diluent, a first active agent comprising an anti-sense oligonucleotide(s) (oligo(s)), and a second active agent comprising an anti-inflammatory steroid and/or a ubiquinone, in amounts effective for alleviating a variety of airway or lung diseases, and other diseases such as cancers or their metastasis, among others. This invention provides the targeted administration of one or more oligo(s) in combination with a second active agent that has a more generalized effect as an anti-inflammatory, and alleviates bronchoconstriction, surfactant or ubiquinone depletion, and respiratory airway allergies. The oligos may be directed to one or more of a number of targets, and are delivered by any route, preferably through the airways to attain a fast and localized delivery through the mucosal tissue of the lungs to permit their hybridization to a desired target polynucleotide to prevent gene transcription and/or translation, thereby reducing, hampering or completely stopping gene expression. This may be attained by means of a solid powdered or liquid solution, suspension or emulsion, such as an aerosol, for administration into the respiratory airways, or direct instillation into the lung(s). While both active agents may be administered via the respiration, it is also possible to administer one by another route, e.g. steroids. The oligos employed in the composition are suitable for altering effects mediated by a variety of target polynucleic acids, such as regulatory nucleic acid sequences, genes and mRNAs, that are associated with diseases and conditions affecting the pulmonary and respiratory tracts, among others, and their associated effects, e.g. bronchoconstriction, respiratory tract inflammation, immune mediated reactions, lung surfactant deficiency(ies), respiratory allergy(ies) and other airway problems, which may be caused by different conditions, including pulmonary vasoconstriction, inflammation, respiratory allergies, asthma, impeded respiration, respiratory distress syndrome (RDS), pain, cystic fibrosis (CF), allergic rhinitis, pulmonary hypertension and fibrosis, sepsis, dyspnea, acute respiratory distress syndrome (ARDS), as well as its variations in pregnant mothers and new-borns (RDS), pulmonary fibrosis, emphysema, chronic obstructive pulmonary disease (COPD), bronchitis, and cancers such as leukemias, lymphomas, carcinomas, and the like, e.g. lung cancer, colon cancer, breast cancer, pancreatic cancer, hepatocellular carcinoma, kidney cancer, melanoma, hepatic metastases, etc., as well as all cancers which may metastasize or have metastasized to the lung(s), including breast and prostate cancer. The present agents are also suitable for administration before, during and after other treatments, including radiation, chemotherapy, antibody therapy, phototherapy, and cancer and other surgeries.

The second active agent is selected from an anti-inflammatory steroid such as an adrenal androgen of the chemical formula



wherein R₁, R₂, R₃, R₄, R₆, R₇, R₈, R₉, R₁₀, R₁₂, R₁₃, R₁₄ and R₁₉ are independently H, OR, halogen, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene, (C₁-C₁₀) alkyne, or two or more of R₁, R₂, R₃, R₄, R₆, R₇, R₈, R₉, R₁₀, R₁₂, R₁₃, R₁₄ and R₁₉ can be linked by combination of the atoms of C, O, N, S, P and Si to form a 3 to 15 member ring(s), in the α- and/or β- configuration;

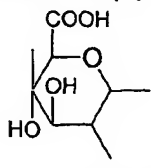
R₅, R₆, R₁₀, and R₁₁ are independently OH, SH, H, halogen, pharmaceutically acceptable ester, pharmaceutically acceptable thioester, pharmaceutically acceptable ether, pharmaceutically acceptable thioether, pharmaceutically acceptable inorganic esters, pharmaceutically acceptable monosaccharide, disaccharide or oligosaccharide, spirooxirane, spirothirane, -OSO₂R₂₀, -OPOR₂₀R₂₁, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene, (C₁-C₁₀) alkyne or OR₂₃,

$$\begin{array}{c} \text{-SO}_2\text{O-CH}_2\text{CHCH}_2\text{OCOR}_{25} \\ | \\ \text{OCOR}_{24} \end{array}$$

- 5 wherein, R₂₃ is hydrogen or SO₂OM, wherein M is selected from H, Na, sulfatide;

$$\begin{array}{c} \text{-PO}_2\text{O-CH}_2\text{CHCH}_2\text{OCOR}_{25} \\ | \\ \text{OCOR}_{24} \end{array}$$

phosphatide, wherein R₂₄ and R₂₅, which may be the same or different, are straight or branched (C₁-C₂₀) alkyl, (C₁-C₂₀) alkene, (C₁-C₂₀) alkyne, sugar, polyethyleneglycol (PEG) or glucuronide



R₅ and R₆ taken together are =O;

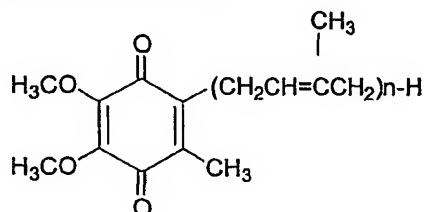
- 10 R₁₀ and R₁₁ taken together are =O;

R₁₅ is (1) H, halogen, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene, (C₁-C₁₀) alkyne, or (C₁-C₁₀) alkoxy when R₁₆ is -C(O)OR₂₂, (2) H, halogen, OH, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene or (C₁-C₁₀) alkyne, when R₁₆ is halogen, OH, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene or (C₁-C₁₀) alkyne, (3) H, halogen, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkenyl, (C₁-C₁₀) alkynyl, formyl, (C₁-C₁₀) alkanoyl or epoxy when R₁₆ is OH, (4) OR, SR, SH, H, halogen, pharmaceutically acceptable ester, pharmaceutically acceptable thioester, pharmaceutically acceptable ether, pharmaceutically acceptable thioether, pharmaceutically acceptable inorganic esters, pharmaceutically acceptable monosaccharide, disaccharide or oligosaccharide, spirooxirane, spirothirane, -OSO₂R₂₀ or -OPOR₂₀R₂₁ when R₁₆ is H, or R₁₅ and R₁₆ taken together are =O;

20

R₁₇ and R₁₈ are independently (1) H, -OH, halogen, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene, (C₁-C₁₀) alkyne or -(C₁-C₁₀) alkoxy when R₆ is H OR, halogen, (C₁-C₁₀) alkyl or -C(O)OR₂₂, (2) H, (C₁-C₁₀) alkyl)_n amino, (C₁-C₁₀) alkene)_n amino, (C₁-C₁₀) alkyne)_n amino, ((C₁-C₁₀) alkyl)_n amino-(C₁-C₁₀) alkyl, ((C₁-C₁₀) alkene)_n amino-(C₁-C₁₀) alkyl, ((C₁-C₁₀) alkyne)_n amino-(C₁-C₁₀) alkyl, ((C₁-C₁₀) alkyl)_n amino-(C₁-C₁₀) alkene, ((C₁-C₁₀) alkene)_n amino-(C₁-C₁₀) alkene, ((C₁-C₁₀) alkyne)_n amino-(C₁-C₁₀) alkene, ((C₁-C₁₀) alkyl)_n amino-(C₁-C₁₀) alkyne, ((C₁-C₁₀) alkene)_n amino-(C₁-C₁₀) alkyne, (C₁-C₁₀) alkoxy, hydroxy - (C₁-C₁₀) alkyl, hydroxy - (C₁-C₁₀) alkene, hydroxy - (C₁-C₁₀) alkyne, (C₁-C₁₀) alkoxy - (C₁-C₁₀) alkyl, (C₁-C₁₀) alkoxy - (C₁-C₁₀) alkene, (C₁-C₁₀) alkoxy - (C₁-C₁₀) alkyne, (halogen)_m (C₁-C₁₀) alkyl, (halogen)_m (C₁-C₁₀) alkene, (halogen)_m (C₁-C₁₀) alkyne, (C₁-C₁₀) alkanoyl, formyl, (C₁-C₁₀) carbalkoxy or (C₁-C₁₀) alkanoyloxy when R₁₅ and R₁₆ taken together are =O, (3) R₁₇ and R₁₈ taken together are =O; (4) R₁₇ and R₁₈ taken together with the carbon to which they are attached form a 3-6 member ring containing 0 or 1 oxygen atom; or (5) R₁₅ and R₁₇ taken together with the carbons to which they are attached form an epoxide ring; R₂₀ and R₂₁ are independently OH, pharmaceutically acceptable ester or pharmaceutically acceptable ether; R₂₂ is H, (halogen)_m (C₁-C₁₀) alkyl, (halogen)_m (C₁-C₁₀) alkene, (halogen)_m (C₁-C₁₀) alkyne, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene or (C₁-C₁₀) alkyne; n is 0, 1 or 2; and m is 1, 2 or 3; or pharmaceutically or veterinarily acceptable salts thereof; and/or

a ubiquinone of the chemical formula



(II)

(CoQ_n),

wherein *n* is 1 to 12, the agent being present in an amount effective for treating respiratory lung diseases and conditions, or for reducing levels of, or sensitivity to, adenosine in a subject's tissue (s); and/or pharmaceutically acceptable salts of either of them.

One group of preferred steroids having a general formula (Ib) are 21-acetoxypregnenolone ((3 β)-21-(acetyloxy)-3-hydroxypregn-5-en-20-one; Herloff and Inhoffen, US Patent No. 2,409,043); alclometasone ((7 α , 11 β , 16 α)-7-Chloro-11, 17, 21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione; Green et al., US Patent No. 4,076,708, and Green and Shue, US Patent No. 4,124,707), or its 17,21-dipropionate form (C₂₈H₃₇ClO₇); algestone ((16 α)-16,17-dihydroxypregn-4-ene-3,20-dione; Colton, US Patent No. 2,727,909, Hydorn et al., US Patent No. 3,165,541, and Diassi, US Patent No. 3,027,384), its cyclic acetal with acetone form (C₂₄H₃₄O₄), or its 16 α -methyl ether form (C₂₂H₃₂O₄); amcinonide ((11 β , 16 α)-21-(acetyloxy)-16,17-[cyclopentylidenebis(oxy)]-9-fluoro-11-hydroxypregna-1,4-di-ene-3,20-dione; Shultz et al., German Patent No. 2,437,847); beclomethasone ((11 β ,16 β)-9-chloro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione; British Patent No. 912,378, British Patent No. 901,093, Elks et al., Belgium Patent No. 649,170, and US Patent No. 3,312,590), its dipropionate form (C₂₈H₃₇ClO₇), or its monopropionate form; betamethasone ((11 β , 16 β)-9-fluoro-11, 17, 21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione; US Patent No. 3,053,865, and Amiard et al., US Patent No. 3,104,246), its 21-acetate form (C₂₄H₃₁FO₆), its 21-adamantoate form (C₃₃H₄₃FO₆; Philips and English, German Patent No. 2,232,827), its 17-benzoate form (C₂₉H₃₃FO₆), its 17, 21-dipropionate form (C₂₈H₃₇FO₇), its 17-valerate form (C₂₇H₃₇FO₆; Dutch Patent Application No. 6,406,615), or its 21-phosphate disodium salt form (C₂₂H₂₈FN₂O₈P); budesonide ((11 β , 16 α)-16,17-[butylidenebis(oxy)]-11, 21-dihydropregna-1,4-diene-3,20-dione; Brattsand et al., German Patent No. 2,323,215, and US Patent No. 3,929,768); chloroprednisone ((6 α)-chloro-17,21-dihydroxypregna-1,4-diene-3,11,20-trione; Batres et al., German Patent No. 1,079,042, and Ringold and Rosenkrantz, US Patent No. 2,957,895), or its 21-acetate form (C₂₃H₂₇ClO₆); ciclesonide (Taylor et al., Am J Respir Crit Care Med (1999) 160(1), 237-43); clobetasol ((11 β ,16 β)-21-chloro-9-fluoro-11,17-dihydroxy-16-methylpregna-1,4-diene-3,20-dione; Elks et al., German Patent No. 1,902,340, and US Patent No. 3,721,687), or its 17-propionate form (C₂₅H₃₂ClFO₅); clobetasone ((16 β)-21-chloro-9-fluoro-17-hydroxy-16-methylpregna-1,4-diene-3,11,20-trione; Elks et al., German Patent No. 1,902,340, and US Patent No. 3,721,687), or its 17-butyrate form (C₂₆H₃₂ClFO₅); clocortolone ((6 α ,11 β ,16 α)-9-chloro-6-fluoro-11,21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione; Dutch Patent Application No. 6,412,708, Kasper and Philippson, German Patent No. 2,011,559, and US Patent No. 3,729,495), its 21-acetate form (C₂₄H₃₀ClFO₅), or its 21-pivalate form (C₂₇H₃₆ClFO₅); cloprednol ((11 β)-6-chloro-11,17,21-trihydroxypregna-1,4,6-triene-3,20-dione; France Patent No. 1,271,981, and US Patent No.3,232,965); coroxon (phosphoric acid 3-chloro-4-methyl-2-oxo-2H-1-benzopyran-7-yl diethyl ester; Fusco et al., US Patent No. 2,951,851); cortisone (17,21-dihydroxypregn-4-ene-3,11,20-trione; Reichstein, US Patent No. 2,403,683, and Gallagher, US Patent No. 2,447,325), its 21-acetate form (C₂₃H₃₀O₆), or its 21-cyclopentanepropionate form (C₂₉H₄₀O₆), examples of brand name for cortisone include Cortone Acetate, Adreson, Altesona, Cortelan, Cortistab, Cortisyl, Cortogen, Cortone, and Scheroson; cortivazol ((11 β ,16 α)-21-(acetyloxy)-11,17-dihydroxy-6,16-dimethyl-2'-phenyl-2'-H-pregna-2,4,6-trieno[3,2-c]pyrazol-20-one; Tishler et al., US Patent No. 3,067,194, and US Patent No. 3,300,483); deflazacort ((11 β ,16 β)-21-(acetyloxy)-11-hydroxy-2'-methyl-5'-H-pregna-1,4-dieno[17,16-d]oxazole-3,20-dione; Nathansohn and Winters, Belgium Patent No. 679,820, British Patent No. 1,077,393, and US Patent No. 3,436,389); desonide ((11 β ,16 α)-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione; Bernstein and Allen, US Patent No. 2,990,401, Lee et al., US Patent No. 3,536,586, and Diassi and Principe, US Patent No. 3,549,498); desoximetasone ((11 β ,16 α)-9-fluoro-11, 21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione; Joly et al., France Patent No. 1,296,544, US Patent No. 3,099,654, Belgium Patent No. 614,196, and Kieslich et al., US Patent No. 3,232,839); dexamethasone ((11 β ,16 α)-9-fluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione; Muller et al., US Patent No. 3,007,923, Arth et al., German Patent No. 1,113,690, and British Patent No. 869,511), its 21-acetate form (C₂₄H₃₁FO₆), its 21-(3,3-dimethylbutyrate) form (C₂₈H₃₉FO₆; Chemerda et al., US Patent No. 2,939,873), its 21-diethylaminoacetate form (C₂₈H₄₁FNO₆), its 21-isonicotinate form (C₂₈H₄₁FNO₆), its 17,21-dipropionate form (C₂₈H₃₇FNO₆), or its 21-palmitate form (C₃₈H₅₉FO₆), examples of brand name for dexamethasone include Decadron-oral, Dexameth, Dexone, Hexadrol-oral, Dexamethasone Intensol, Dexone 0.5, Dexone 0.75, Dexone 1.5, and Dexone 4; diflorasone ((6 α ,11 β ,16 β)-6,9-difluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione; British Patent No. 881,334, British Patent No. 898,293, Lincoln et al., US Patent No. 3,557,158, and British Patent No. 912,015), or its diacetate form (C₂₆H₃₂F₂O₇; Ayer et al., German Patent No. 2,308,731, and

- US Patent No. 3,980,778); diflucortolone ((6 α ,11 β ,16 α)-6,9-difluoro-11,21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione; Belgium Patent No. 639,708, and Kieslich et al., US Patent No.3,426,128), or its 21-valerate form (C₂₇H₃₆F₂O₅); difluprednate ((6 α ,11 β)-21-(acetyloxy)-6,9-difluoro-11-hydroxy-17-(1-oxobutoxy)pregna-1,4-diene-3,20-dione; Ercoli and Gardi, South African Patent No. 680,386, and Ercoli et al., US Patent No. 3,780,177);
- 5 enoxolone ((3 β ,20 β)-3-hydroxy-11-oxoolean-12-en-29-oic acid; British Patent No. 833,184), or its 18 α -hydrogen form; fluaacort ((11 β ,16 β)-21-(acetyloxy)-9-fluoro-11-hydroxy-2'-methyl-5'H-pregna-1,4-dieno[17,16-d]oxazole-3,20-dione; British Patent No. 1,119,082, and US Patent No. 3,461,119); flucoronide ((6 α ,11 β ,16 α)-9,11-dichloro-6-fluoro-21-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]-pregna-1,4-diene-3,20-dione; Bowers, US Patent No. 3,201,391); flumethasone ((6 α ,11 β ,16 α)-6,9-difluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione;
- 10 British Patent No. 902,292, and Lincoln et al., US Patent No. 3,499,016), its 21-acetate form (C₂₄H₃₀F₂O₆), or its 21-pivalate form (C₂₇H₃₆F₂O₆); flunisolide ((6 α ,11 β ,16 α)-6-fluoro-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione; British Patent No. 933,867, Ringold and Rosenkranz, US Patent No. 3,124,571, and Ringold et al., US Patent No. 3,126,375), or its 21-acetate form (C₂₆H₃₃FO₇); fluocinolone acetate ((6 α ,11 β ,16 α)-6,9-difluoro-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]-pregna-1,4-diene-3,20-dione;
- 15 Mills and Bowers, US Patent No. 3,014,938, and Ringold et al., US Patent No. 3,126,375); fluocinonide ((6 α ,11 β ,16 α)-21-(acetyloxy)-6,9-difluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]-pregna-1,4-diene-3,20-dione; British Patent No. 916,996, Ringold and Rosenkranz, US Patent No. 3,124,571, Ringold et al., US Patent No. 3,126,375, and Fried, US Patent No. 3,197,469); flucortin butyl ((6 α ,11 β ,16 α)-6-fluoro-11-hydroxy-16-methyl-3,20-dioxopregna-1,4-dien-21-oic acid butyl ester; Laurent et al., German Patent Nos. 2,150,268 and
- 20 2,150,270, and US Patent No. 3,824,260); flucortolone ((6 α ,11 β ,16 α)-6-fluoro-11,21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione; Belgium Patent 614,196, and Kieslich et al., US Patent No. 3,232,839), its 21-acetate form (C₂₄H₃₁FO₅), its 21-hexanoate form (C₂₈H₃₉FO₅), or its 21-pivalate form (C₂₂H₃₇FO₅); fluorometholone ((6 α ,11 β)-9-fluoro-11,17-dihydroxy-6-methylpregna-1,4-diene-3,20-dione; Lincoln et al., US Patent No. 2,867,637), or its 17-acetate form (C₂₄H₃₁FO₅; Magerlein et al., US Patent No. 3,038,914); fluperolone acetate ([11 β ,17 α ,17(S)]-17-[2-(acetyloxy)-1-oxopropyl]-9-fluoro-11,17-dihydroxyandrosta-1,4-dien-3-one; Agnello and Laubach, US Patent No. 3,234,095); fluprednidene acetate ((11 β)-21-(acetyloxy)-9-fluoro-11,17-dihydroxy-16-methylenepregna-1,4-diene-3,20-dione; Wendler et al., US Patent Nos. 3,065,239, 3,068,224, 3,068,226 and 3,136,760); fluprednisolone ((6 α ,11 β)-6-fluoro-11,17,21-trihydroxypregna-1,4-diene-3,20-dione; Batres et al., German Patent No. 1,079,042, and Lettre and Hotz, German Patent No. 1,088,953), or its 21-acetate form (C₂₃H₂₉FO₆); flurandrenolide
- 30 ((6 α ,11 β ,16 α)-6-fluoro-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregn-4-ene-3,20-dione; Ringold et al., German Patent No. 1,131,213, and US Patent No. 3,126,375); fluticasone propionate ((6 α ,11 β ,16 α ,17 α)-6,9-difluoro-11-hydroxy-16-methyl-3-oxo-17-(1-oxopropoxy)androsta-1,4-diene-17-carbothioic acid S-(fluoromethyl) ester; Dutch Patent Application No. 8,100,707, and Phillipps et al., US Patent No. 4,335,121); formocortol ((11 β ,16 α)-21-(acetyloxy)-3-(2-chloroethoxy)-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]-20-
- 35 oxopregna-3,5-diene-6-carboxaldehyde; Camerino et al., France Patent No. 1,396,602, Dutch Patent Application No. 6,508,458, and US Patent No. 3,314,945); halcinonide ((11 β ,16 α)-21-chloro-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregn-4-ene-3,20-dione; Difazio and Augustine, German Patent No. 2,355,710, and US Patent No. 3,892,857); halobetasol propionate (6 α ,11 β ,16 β)-21-chloro-6,9-difluoro-11-hydroxy-16-methyl-17-(1-oxopropoxy)pregna-1,4-diene-3,20-dione; Kalvoda and Anner, German Patent No. 2,743,069, and US Patent No.
- 40 4,619,921); halometasone ((6 α ,11 β ,16 α)-2-chloro-6,9-difluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione; Anner et al., Dutch Patent Application No. 540,244, US Patent No. 3,652,554, and Swiss Patent No. 551,399), or its monohydrate form (C₂₂H₂₇ClF₂O₅•H₂O); halopredone acetate ((6 β ,11 β)-17,21-bis(acetyloxy)-2-bromo-6,9-difluoro-11-hydroxypregna-1,4-diene-3,20-dione; Riva and Toscano, German Patent No. 2,508,136, and Riva et al., US Patent No. 4,226,862); hydrocortamate (N,N-diethylglycine (11 β)-11,17-dihydroxy-3,20-dioxopregn-4-en-21-yl ester; Pinson and Laubach, German Patent No. 1,016,708, and Richter and Schenck, German Patent No. 1,037,451), or its hydrochloride form (C₂₇H₄₁NO₆•HCl); hydrocortisone ((11 β)-11,17,21-trihydroxypregn-4-ene-3,20-dione; Murray and Peterson, US Patent No. 2,602,769), its 21-acetate form (C₂₃H₃₂O₆), its 17-butyrate form (C₂₅H₃₆O₆), its 21-phosphate disodium salt form (C₂₁H₂₉Na₂O₈P), its 21-sodium succinate form (C₂₅H₃₃NaO₈), its 17-valerate form (C₂₆H₃₈O₆), or its cypionate form (Munson and Wilson, J Pharm Sci (1981)
- 45 70(2), 177-81), examples of brand name for hydrocortisone include Cortef, Hydrocortone, examples of brand name for hydrocortisone cypionate include Cortef Oral Suspension; loteprednol etabonate ((11 β ,17 α ,-17-

[(ethoxycarbonyl)oxy]-11-hydroxy-3-oxoandrost-1,4-diene-17-carboxylic acid chloromethyl ester; Bodor, Belgium Patent No. 889,563, and US Patent No. 4,996,335); mazipredone ((11 β)-11,17-dihydroxy-21-(4-methyl-1-piperazinyl)pregna-1,4-diene-3,20-dione; Tuba et al., Hungarian Patent No. 150,350), or its hydrochloride form (C₂₆H₃₈N₂O₄•HCl); medrysone ((6 α ,11 β)-11-hydroxy-6-methylpregn-4-ene-3,20-dione; Sebek et al., US Patent No. 2,864,837, and Spero and Thompson, US Patent No. 2,968,655); meprednisone ((16 β)-17,21-dihydroxy-16-methylpregna-1,4-diene-3,11,20-trione; British Patent No. 901,092, and Rausser and Oliveto, US Patent No. 3,164,618), or its 21-acetate form (C₂₄H₃₀O₆); methylprednisolone ((6 α ,11 β)-11,17,21-trihydroxy-6-methylpregna-1,4-diene-3,20-dione; Sebek and Spero, US Patent No. 2,897,218, and Gould, US Patent No. 3,053,832), its 21-acetate form (C₂₄H₃₂O₆), its 21-phosphate disodium salt form (C₂₂H₂₉Na₂O₈P), its 21-succinate sodium salt form (C₂₆H₃₃NaO₈), or its aceponate form (C₂₇H₃₆O₇), examples of brand name for methylprednisolone include Medrol-Oral; mometasone furoate ((11 β ,16 α)-9,21-dichloro-17-[(2-furanylcarbonyl)oxy]-11-hydroxy-16-methylpregna-1,4-diene-3,20-dione; Shapiro, European Patent Application No. 57,401, and US Patent No. 4,472,393); paramethasone ((6 α ,11 β ,16 α)-6-fluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione; Edwards et al., J. Am.Chem.Soc. (1960) 82, 2318), its 21-acetate form (C₂₄H₃₁FO₆), its disodium phosphate form, or a mixture of its 21-acetate and disodium phosphate form; prednicarbate ((11 β)-17[(ethoxycarbonyl)oxy]-11-hydroxy-21-(1-oxopropoxy)pregna-1,4-diene-3,20-dione; Stache et al., Germany Patent No. 2,735,110, and US Patent No. 4,242,334); prednisolone ((11 β)-11,17,21-trihydroxypregna-1,4-diene-3,20-dione; Nobile, US Patent Nos. 2,837,464 and 3,134,718), its 21-acetate form (C₂₃H₃₀O₆), its 21-*tert*-butylacetate form (C₂₇H₃₈O₆; Sarrett, US Patent No. 2,736,734), its 21-hydrogen succinate form (C₂₅H₃₂O₈), its 21-succinate sodium salt form (C₂₅H₃₁NaO₈; Shull and Kita, German Patent No. 1,045,400), its 21-stearoylglycolate form (C₄₁H₆₄O₈; Giraldi and Nannini, US Patent No. 3,171,846), its 21-*m*-sulfo benzoate sodium salt form (C₂₈H₃₁NaO₉S; (11 β)-11,17-dihydroxy-21-[(3-sulfo benzoyl)oxy]pregna-1,4-diene-3,20-dione monosodium salt; Allais and Girault, US Patent No. 3,032,568, Joly and Warnant, US Patent No. 3,037,034), or its 21-trimethylacetate form (C₂₆H₃₆O₆; Joly and Warnant, US Patent No. 3,037,034), examples of brand name for prednisolone include Prelone, Delta-Cortef, Pediapred, Adnisolone, Cortalone, Deltacortril, Deltasolone, Deltastab, Di-Adreson F, Encortolone, Hydrocortancyl, Medisolone, Meticortelone, Opredsone, Panaafcortelone, Precortisyl, Prenisolona, Scherisolona, Scherisolone; prednisolone 21-diethylaminoacetate (N,N-diethylglycine (11 β)-11,17-dihydroxy-3,20-dioxopregna-1,4-dien-21-yl ester; British Patent No. 862,370), or its hydrochloride form (C₂₇H₃₉NO₆•HCl); prednisolone sodium phosphate (11,17-dihydroxy-21-(phosphonoxy)pregna-1,4-diene-3,20-dione disodium salt; Sarett, US Patent No. 2,789,117, and Elks and Philipps, US Patent No. 2,936,313); prednisone (17,21-dihydroxypregna-1,4-diene-3,11,20-trione; Oliveto and Gould, US Patent No. 2,897,216, and Nobile, US Patent Nos. 2,837,464 and 3,134,718), or its 21-acetate form (C₂₃H₂₈O₆), examples of brand name for prednisone include Deltasone, Liquid Pred, Meticorten, Orasone 1, Orasone 5, Orasone 10, Orasone 20, Orasone 50, Prednicen-M, Prednisone Intensol, Sterapred, Sterapred DS, Adasone, Cartancyl, Colisone, Cordrol, Cortan, Dacortin, Decorti, Decortisyl, Delcortin, Dellacort, Delta-Dome, Deltacortene, Deltisona, Diadreson, Econosone, Encorton, Fernisone, Nisona, Novoprednisone, Panafcort, Panasol, Paracort, Parmenison, Pehacort, Predeltin, Prednicort, Prednicot, Prednidib, Predniment, Rectodelt, Ultracorten, Winpred; prednival ((11 β)-11,21-dihydroxy-17-[(1-oxopentyl)oxy]pregna-1,4-diene-3,20-dione; Ercoli and Gardi, US Patent No. 3,152,154), or its 21-acetate form (C₂₈H₃₈O₇); prednylidene ((11 β)-11,17,21-trihydroxy-16-methylenepregna-1,4-diene-3,20-dione; Mannhardt et al., Tetrahedron Letters (1960) 16, 21), or its 21-diethylaminoacetate hydrochloride form (C₂₈H₃₉NO₆•HCl; German Patent No. 1,134,074); rimexolone ((11 β ,16 α ,17 β)-11-hydroxy-16,17-dimethyl-17-(1-oxopropyl)androst-1,4-dien-3-one; Dutch Patent Application No. 7,300,313, and Woods et al., US Patent No. 3,947,478); rofleponide ((22R)-6 α ,9 α -Difluoro-11 β ,21-dihydroxy-16 α ,17 α -propylmethylenedioxyregn-4-ene-3,20-dione; Thalen and Wickstrom, Steroids (2000) 65(1), 16-23); tipredane ((11 β , 17 α)-17-(ethylthio)-9 α -fluoro-11 β -hydroxy-17-(methylthio) androst-1,4-dien-3-one; Wojnar et al., Arzneimittelforschung (1986) 36(12), 1782-7); tixocortol ((11 β)-11,17-dihydroxy-21-mercaptopregn-4-ene-3,20-dione; Simons et al., J Steroid Biochem (1980) 13, 311), or its 21-pivalate form (C₂₆H₃₈O₅S; (11 β)-21-[(2,2-dimethyl-1-oxopropyl)thio]-11,17-dihydroxypregn-4-ene-3,20-dione; Torossian et al., German Patent No. 2,357,778, and US Patent No. 4,014,909); triamcinolone ((11 β ,16 α)-9-fluoro-11,16,17,21-tetrahydroxypregna-1,4-diene-3,20-dione; Bernstein et al., US Patent No. 2,789,118, and Allen et al., US Patent No.3,021,347), or its 16,21-diacetate form (C₂₅H₃₁FO₈; (11 β ,16 α)-16,21-bis(acetyloxy)-9-fluoro-11,17-dihydroxypregna-1,4-diene-3,20-dione), examples of brand name for triamcinolone include Kenacort, Aristocort, Atolone, Sholog A, Tramacort-D, Tri-Med,

Triamcot, Tristo-Plex, Trylone D, U-Tri-Lone; Triamcinolone acetonide ((11 β ,16 α)-9-fluoro-11,21-dihydroxy-16,17-[1-methylethylidenebis(oxy)]pregna-1,4-diene-3,20-dione; Bernstein and Allen, US Patent No. 2,990,401, and Hydorn, US Patent No. 3,035,050), its 21-acetate crystal form, its 21-disodium phosphate form (C₂₄H₃₀FN₂O₉P), or its 21-hemisuccinate form (C₂₈H₃₅FO₉); triamcinolone benetonide ((11 β ,16 α)-21-[3-(benzoylamino)-2-methyl-1-oxopropoxy]-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione; Cavazza et al., German Patent No. 2,047,218, and US Patent No. 3,749,712); and triamcinolone hexacetonide ((11 β ,16 α)-21-(3,3-dimethyl-1-oxobutoxy)-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione; Nash and Naeger, US Patent No. 3,457,348). Preferably, the steroids comprises budesonide, testosterone, progesterone, estrogen, flunisolide, triamcinolone, beclomethasone, betamethasone, dexamethasone, fluticasone, methylprednisolone, prednisone, hydrocortisone, and mometasone. Another group of preferred steroids are mineralocorticoid steroids including aldosterone, deoxycorticosterone, deoxycorticosterone acetate and fludrocortisone. However, others are also suitable.

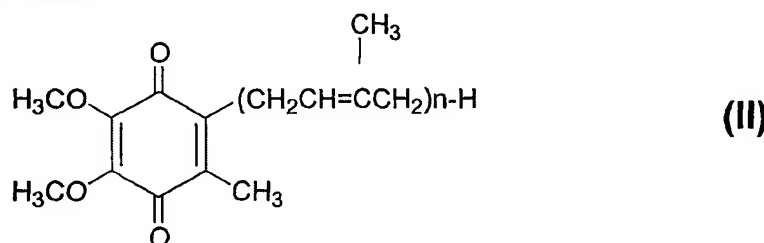
Also provided is a method for reducing or depleting adenosine levels, or treating hypersensitivity to adenosine, particularly in the lung, liver, heart and/or brain, or increasing levels of lung surfactant or of ubiquinone in the lung, heart or other tissues, and for treating various respiratory, lung and other diseases and their symptoms, by administering to a subject in need of such treatment a first active agent comprising the anti-sense oligo of the invention, and a second active agent comprising the AIS of chemical formula (Ia) and (Ib) exemplified by corticosteroids and dehydroepiandrosterones, analogues thereof, and pharmaceutically or veterinarily acceptable salts thereof, such as dehydroepiandrosterone sulfate (DHEA-S), and salts of the corticosteroids, and/or a ubiquinone of chemical formula (II) as described above, the active agents being present in amounts effective to reduce or deplete adenosine levels, or reduce adenosine hypersensitivity, or to increase lung surfactant levels or ubiquinone tissue levels, or to inhibit or control a variety of respiratory, lung and other diseases and conditions in the subject. Examples of non-glucocorticoid steroids that may be used to carry out this method are represented by the chemical formula (Ia) shown above.

Another group of preferred steroids for use in this invention are described below. The hydrogen atom at position 5 of the compound of chemical formula (Ia) may be present in the alpha or beta configuration, and the compound may comprise a mixture of both configurations. Compounds illustrative of compounds of chemical formula (I) above include DHEA, wherein R and R₁ each comprise hydrogen and the double bond is present; 16-alpha bromodehydroepiandrosterone, where R comprises Br, R₁ comprises H, and the double bond is present; 16-alpha-fluorodehydroepiandrosterone, wherein R comprises F, R₁ comprises H and the double bond is present; etiocholanolone, where R and R₁ each comprise hydrogen and the double bond is absent (the single bond is present); and dehydroepiandrosterone sulphate (DHEA-S), wherein R comprises H, R₁ comprises SO₂OM and M comprises sulphatide as defined above, and the double bond is present, among others. In the compound of formula I, R preferably comprises halogen, e.g. bromo, chloro, or fluoro, R₁ comprises hydrogen, and the double bond is present. Most preferably the compound of Formula I comprises dehydroepiandrosterone sulphate and 16- α -fluorodehydroepiandrosterone. The compounds of formula I may be made in accordance with procedures known in the art, or employing variations thereof that will be apparent to those skilled in the art. See, for example, U.S. Patent No. 4,956,355, UK Patent No. 2,240,472, EPO Patent Application No. 429,187, Patent Publication WO9104030A1; Abou-Gharbia M. et al., J. Pharm. Sci. 70: 1154-1157 (1981), Merck Index Monograph No. 7710, 11th Ed. (1989). Other preferred non-glucocorticoid steroids are those of the formulas (III) and (IV), wherein R₁₅ and R₁₆ together are =O, or where R₅ is OH, or where R₅ is -OSO₂R₂₀, or where R₂₀ is H. Others, however, are also preferred and are encompassed by this patent.

"Corticosteroid", as used herein, means 21-carbon steroid hormone corticoids that bind to glucocorticoid receptors, having the chemical formula of (Ib). Corticosteroids are agonists for the glucocorticoid steroid receptor(s) and interact to promote a transcriptional response. The corticosteroids and other AIS may be used in conjunction with, and for reducing the amount of the oligo(s) employed for reducing inflammation and lung allergy(ies), reducing or depleting levels of, or reducing sensitivity to, adenosine, reducing adenosine receptor levels, producing bronchodilation, and/or for increasing levels of ubiquinone or lung surfactant in a subject, or for treating bronchoconstriction, lung inflammation or allergies or a respiratory or lung disease or condition. The anti-inflammatory steroid(s) may be administered per se or in the form of pharmaceutically acceptable salt, as discussed above. In general, the anti-inflammatory steroid(s), and its(their) salt(s) and crystal forms are suitable, and may be administered in a dosage of about 0.01, about 0.1, about 0.4, about 1, about 5, about 10, about 20 to about 4, about

30, about 70, about 100, about 300, about 1,000, about 3600 mg/kg body weight. These active compounds may be administered once or several times a day, or in any other regime, upon adjustment of the dose in accordance with the dosages of the other agents being administered.

The term "ubiquinone", as used herein, refers to a family of compounds having structures based on a ω 3-dimethoxy-5-methyl benzoquinone nucleus with a variable terpenoid acid chain containing on to twelve non-unsaturated trans-isoprenoid units. Such compounds are also known in the art as "Coenzyme Q_n", wherein n comprises 1 to 12, preferably n comprising 1 to 10, and may be referred to herein as compounds represented by the following chemical formula



wherein n comprises 1 to 10. In the method of the invention, another preferred ubiquinone is a compound according to the above formula, where n comprises 6 to 10, i.e. Coenzyme Q₆₋₁₀, and most preferably wherein n comprises 10, i.e. Coenzyme Q₁₀.

As discussed above, the "active agents or compounds" may be administered per se or in the form of pharmaceutically acceptable salts, or in the same formulation with the other active agents of the invention, e.g. corticosteroid(s) and/or ubiquinone(s) and the anti-sense oligo, either systemically or topically. In general, they are administered in an amount effective to treat respiratory conditions including bronchoconstriction, respiratory inflammation and allergies, allergic rhinitis, pulmonary hypertension and fibrosis, apnea, sepsis, emphysema, cancers, asthma, COPD, RDS, CF, ARDS, and the like, and/or to off-set lung surfactant depletion or ubiquinone depletion in the lungs and/or heart of the subject if induced by the administration of the anti-inflammatory steroid of the invention. The ubiquinone is preferably administered in a total amount per day of about 0.1, about 1, about 5, about 10, about 15, about 30 to about 50, about 100, about 150, about 300, about 600, about 900, about 1200 mg/kg body weight per day. More preferred are about 1 to about 150 mg/kg, about 30 to about 100 mg/kg, and most preferred about 5 to about 50 mg/kg. The ubiquinone may be administered in one dose (once or several times a day), and its dose may be adjusted as is known in the art, depending on whether it is administered alone, or with the oligo and/or the anti-inflammatory steroid, and their amounts used. The dosage of the ubiquinone will vary depending upon the condition of the subject and route of administration. The ubiquinone may be administered by itself, or as a mixture of ubiquinones of varying side chain lengths, or concurrently, jointly prior to or subsequent to the anti-sense oligo and/or the anti-inflammatory steroid, for treating the overall symptoms described here, and/or the various diseases associated with them, including asthma, COPD, allergic rhinitis, pulmonary hypertension, vasoconstriction and fibrosis, and others described above. The phrase "concurrently administering", as used herein, means that the steroid, e. g. DHEA, DHEA-S or analogs of formulas (Ia) and (Ib), the anti-sense oligos, and the ubiquinone of chemical formula (II) are administered either (a) simultaneously in time, preferably by formulating the two active agents together in a common pharmaceutical carrier, or (b) at different times during the course of a common treatment schedule through the same or different routes of administration. In the latter case, for example the oligo may be administered once a week or its administration may be varied in accordance with its duration of action, while steroid(s) and ubiquinone(s) is(are) administered at times sufficiently close so that, in addition to its direct effect, the ubiquinone will be also off-setting any ubiquinone depletion in the subject's tissues, e. g. lungs and heart. This timing helps to prevent or counter-balance any deterioration of tissue, e. g. lung and heart, function that may result from the administration of the steroids or analogs thereof. Where the ubiquinone is formulated with a pharmaceutically acceptable carrier and other oral formulation components, it may be administered separately from the steroid and/or the oligo. For example, the steroid and the oligo may be administered into the respiration, by inhalation, nasally or into the lungs (by instillation) of the subject whereas the ubiquinone may be administered systemically. The ubiquinone may be formulated by any of the techniques set forth above.

The composition and formulations of this invention are highly efficacious for preventing and treating diseases and conditions associated with bronchoconstriction, difficult breathing, impeded and obstructed lung

airways, allergy(ies), inflammation and surfactant depletion, among others. Examples of diseases and conditions which are suitably treated by the present method are diseases and conditions, including Acute Respiratory Distress Syndrome (ARDS), asthma, adenosine administration e.g. in the treatment of SupraVentricular Tachycardia (SVT) and other arrhythmias, and in stress tests to hyper-sensitized individuals, ischemia, renal damage or failure induced by certain drugs, infantile respiratory distress syndrome, pain, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema, chronic obstructive pulmonary disease (COPD), lung transplantation rejection, pulmonary infections, and cancers such as leukemias, lymphomas, carcinomas, and the like, including colon cancer, breast cancer, lung cancer, pancreatic cancer, hepatocellular carcinoma, kidney cancer, melanoma, hepatic metastases, etc., as well as all types of cancers which may metastasize or have metastasized to the lung(s), including breast and prostate cancer. The invention will be mostly described with respect to the adenosine receptors as targets, although data on other targets is also provided, but is similarly applicable to any other target including the listed targets, with respect to the administration of anti-sense oligos. The examples provided below show a complete inhibition of adenosine receptor associated symptoms in a rabbit model for human bronchoconstriction, allergy(ies) and inflammation as well as the elimination of the ability of the adenosine receptor agonist par excellence, adenosine, to cause bronchoconstriction in hyper-responsive monkeys, which are animal models for human hyper-responsiveness to adenosine receptor agonists. The pharmaceutical composition and formulations of the invention, therefore, are suitable for preventing and alleviating the symptoms associated with stimulation of adenosine receptors, such as the adenosine A₁, A_{2a}, A_{2b}, and A₃ receptors, as well as other single or multiple targets. The compositions and formulations of this invention, thus, are also suitable for prevent the untoward side effects of adenosine-mediated hyperresponsiveness in certain individuals, which are generally seen in diseases affecting respiratory activity.

The method of the present invention may be used to treat airway and lung diseases and conditions in a subject of any kind and for any reason, for example, to reduced or eliminated with the intention that the adenosine content of anti-sense compounds, so as to prevent liberation of adenosine upon anti-sense degradation. Examples of diseases and conditions, which may be treated preventatively, prophylactically and therapeutically with the compositions and formulations of this invention, are pulmonary vasoconstriction, inflammation, allergies, asthma, allergic rhinitis, impeded respiration, Acute Respiratory Distress Syndrome (ARDS), renal damage and failure associated with ischemia as well as the administration of certain drugs, side effects associated with adenosine administration e.g. in SupraVentricular Tachycardia (SVT) and in adenosine stress tests, infantile Respiratory Distress Syndrome (infantile RDS), ARDS, pain, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema, chronic obstructive pulmonary disease (COPD), lung transplantation rejection, pulmonary infections, and cancers such as leukemias, lymphomas, carcinomas, and the like, e.g. colon cancer, breast cancer, lung cancer, pancreatic cancer, hepatocellular carcinoma, kidney cancer, melanoma, metastatic cancer such as hepatic metastases, lung, breast and prostate metastases, among others. The present compositions and formulations are suitable for administration before, during and after other treatments, including radiation, chemotherapy, antibody therapy, phototherapy and cancer, and other types of surgery. The present compositions and formulations may also be administered effectively as a substitute for therapies that have significant negative side effects. The terms "anti-sense" oligonucleotides generally refers to small, synthetic oligonucleotides, resembling single- and double-stranded DNA and RNA, which in this patent are applied to the inhibition of gene expression, e.g. by inhibition of a gene or target messenger RNA (mRNA). See, e.g. Milligan, J. F. et al., J. Med. Chem. 36(14), 1923-1937 (1993); Sharp, P.A. Genes & Development 15, 485-490, 2001; the relevant portion of which is hereby incorporated in its entirety by reference. For consistency's sake, all RNAs, DNAs and oligonucleotides are represented in this patent by a single strand in the 5' to 3' or 3' to 5' direction, when read from left to right, although their complementary and double-stranded sequence(s) is (are) also encompassed within the four corners of the invention. In addition, all nucleotide bases and amino acids are represented utilizing the recommendations of the IUPAC-IUB Biochemical Nomenclature Commission, or by the known 3-letter code (for amino acids). Nucleotide sequences are presented herein by single strand only, in the 5' to 3' direction, from left to right. In addition, nucleotide and amino acids are represented herein in the manner recommended by the IUPAC-IUB Biochemical Nomenclature Commission, or (for amino acids) by three letter code, in accordance with 37 CFR ' 1.822 and established usage. See, e.g., PatentIn User Manual, 99-102 (Nov. 1990) (U.S. Patent and Trademark Office, Office of the Assistant Commissioner for Patents, Washington, D.C. 20231); U.S. Patent No. 4,871,670 to Hudson et al. at col. 3, lines 20-43. The present method utilizes anti-sense agents to inhibit or down-regulate gene expression of

target genes, including those listed in Tables 1 and 2 below. This is generally attained by hybridization of the anti-sense oligonucleotides to coding (sense) sequences of a targeted messenger RNA (mRNA), as is known in the art. The oligos of this invention may be obtained by first selecting fragments of a target nucleic acid having at least 4 contiguous nucleic acids selected from the group consisting of G and C, and then obtaining a first oligonucleotide 4 to 70 nucleotides long which comprises the selected fragment and preferably has a C and G nucleic acid content of up to and including about 20%, about 15%. The oligonucleotide(s) (oligo(s)) may include at least one unmethylated cytosine-guanine (CpG) dinucleotide. The CpG dinucleotide may be substituted for a methylated cytosine present in the anti-sense oligonucleotide(s). The CpG dinucleotide is an immunostimulating sequence and affects the immune response in a subject by activating natural killer cells (NK) or redirecting a subject's immune response from a Th2 to a Th1 response by inducing monocytic and other cells to produce Th1 cytokines. The oligo(s) containing at least one unmethylated CpG can be used for treating and/or preventing respiratory and pulmonary diseases including bronchoconstriction, impaired airways, decreased lung surfactant, asthma, rhinitis, acute respiratory distress syndrome (ARDS), infantile or maternal RDS, chronic obstructive pulmonary disease (COPD), allergies, impeded respiration, lung pain, cystic fibrosis (CF), infectious diseases, cancers such as leukemias, lung and colon cancer, and the like, and diseases whose secondary effects afflict the lungs. A "CpG" or "CpG motif" refers to nucleotides having a cytosine followed by a guanine linked by a phosphate bond. The term "methylated CpG" refers to the methylation of the cytosine on the pyrimidine ring, usually occurring the 5-position of the pyrimidine ring. The term "unmethylated CpG" refers to the absence of methylation of the cytosine on the pyrimidine ring. Methylation, partial removal, or removal of an unmethylated CpG motif in an oligo(s) is believed to reduce its effect. Methylation or removal of all unmethylated CpG motifs in an oligo(s) substantially reduces its effect. The effect of methylation or removal of a CpG motif is "substantial" if the effect is similar to that of an oligonucleotide that does not contain a CpG motif. Preferably the CpG oligonucleotide is in the range of about 8 to 30 bases in size. The oligo(s) can be synthesized de novo using any of a number of procedures well known in the art. For example, the b-cyanoethyl phosphoramidite method (Beaucage, S. L., and Caruthers, M. H., Tet. Let. 22:1859, 1981); nucleoside H-phosphonate method (Garegg et al., Tet. Let. 27:4051-4054, 1986; Froehler et al., Nucl. Acid. Res. 14:5399-5407, 1986; Garegg et al., Tet. Let. 27:4055-4058, 1986; Gaffney et al., Tet. Let. 29:2619-2622, 1988). These chemistries can be performed by a variety of automated oligonucleotide synthesizers available in the market. Alternatively, CpG dinucleotides can be produced on a large scale in plasmids, (see Sambrook, T., et al., Molecular Cloning: A Laboratory Manual, Cold Spring Harbor laboratory Press, New York, 1989) which after being administered to a subject are degraded into an oligo(s). An oligo(s) can be prepared from existing nucleic acid sequences (e.g., genomic or cDNA) using known techniques, such as those employing restriction enzymes, exonucleases or endonucleases. The exogenously administered agents of the invention decrease the levels of mRNA and protein encoded by the target gene and/or cause changes in the growth characteristics or shapes of the thus treated cells. See, Milligan et al. (1993); Helene, C. and Toulme, J. Biochim. Biophys. Acta 1049, 99-125 (1990); Cohen, J. S. D., Ed., Oligodeoxynucleotides as Anti-sense Inhibitors of Gene Expression; CRC Press: Boca Raton, FL (1987), the relevant portion of which is hereby incorporated in its entirety by reference.

The treatment of this invention enhances the effects of the oligonucleotide and the anti-inflammatory steroid(s) and/or ubiquinone(s) by combining them, either simultaneously, sequentially or separately, for reducing or depleting levels of, or reducing sensitivity to, adenosine, reducing levels of receptor(s), producing bronchodilation, or for increasing levels of ubiquinone or lung surfactant in a subject's tissue (s), or treating bronchoconstriction, lung inflammation or allergies or a respiratory or lung disease or condition, and/or for alleviating bronchoconstriction or lung inflammation or allergy(ies), or ubiquinone or lung surfactant depletion or hyposecretion, in a subject. When administered in combination, the dose of the oligonucleotide or the steroid(s) or ubiquinone(s) may be decreased since they potentiate each other's effect. These agents may be administered before, simultaneously with, and/or after each other's administration. Accordingly, the details of administration of the effect enhancer including its amount, route, formulation, method, target organ and/or tissue may be determined as described throughout this specification. Similarly, other therapeutic or bioactive agents may be employed in accordance with this invention. Kits comprising the various agents described above are also part of this invention.

As used herein, "anti-sense oligonucleotide or anti-sense oligo" is generally a short sequence of synthetic nucleotide that hybridizes to any segment of a mRNA encoding a targeted protein under appropriate hybridization conditions and which, upon hybridization, causes a decrease in gene expression of the targeted protein. The terms "desAdenosine" (desA), "des-thymidine" (desT) and "des-uridine (desU) refer to oligonucleotides substantially

lacking either adenosine (desA) or thymidine (desT) (uracil (desU)). In some instances, the desA or desT (desU) sequences are naturally occurring, and in others they may result from substitution of an undesirable nucleotide (A) by another lacking its undesirable activity, such as acting as an agonist or having a triggering effect at the adenosine A receptor(s). In the present context, the substitution is generally accomplished by substitution of A with a "universal or alternative base", presently known in the art or to be ascertained at a later time. As used herein, the terms "prevent", "preventing", "treat" or "treating" refer to a preventative, prophylactic, maintenance, or therapeutic treatment which decreases the likelihood that the subject administered such treatment will manifest symptoms associated with adenosine receptor stimulation. The term "down-regulate" refers to inducing a decrease in production, secretion or availability and, thus, a decrease in concentration, of intracellular target product, be it a receptor, e. g. adenosine A₁, A_{2b}, A₃, bradykinin 2B, GATA-3, or other receptors, or produce a stimulatory effect on a receptor such as the adenosine A_{2a} receptor. The present technology relies on the design of anti-sense oligos targeted to genea and mRNAs associated with ailments involving nasal and lung airway(s) (respiratory tract) pathology(ies), and on their modification to reduce the potential occurrence of undesirable side effects caused by their release of adenosine upon breakdown, while preserving their activity and efficacy for their intended purpose. In this manner, the inventor targets a specific gene to design one or more anti-sense single or double stranded DNA or RNA oligonucleotide(s) (oligos) that selectively bind(s) to the corresponding gene or mRNA, and then reduces, if necessary, their content of adenosine via substitution with an alternative or a universal base, or an adenosine analog incapable of significantly, or having substantially reduced ability for, activating or antagonizing adenosine A₁, A_{2b} or A₃ receptors or which may act as an agonist at the adenosine A_{2a} receptor. Any number of adenosines present may be substituted by an alternative and/or universal base, such as heteroaromatic bases, which binds to a thymidine or uridine base but has less than about 0.3 of the adenosine base agonist or antagonist activity at the adenosine A₁, A_{2a}, A_{2b} and A₃ receptors. Based on his prior experience in the field, the inventor reasoned that in addition to "downregulating" specific genes, he could increase the effect of the agent(s) administered by either selecting segments of RNA that are devoid, or have a low content, of thymidine (T) or uridine (U), or alternatively, substitute one or more adenosine(s) present in the designed oligonucleotide(s) with other nucleotide bases, so called universal bases, which bind to thymidine but lack the ability to activate adenosine receptors and otherwise exercise the constricting effect of adenosine in the lungs, etc. Given that adenosine (A) is a nucleotide base complementary to thymidine (T) or uridine (U), wherein when a U appears in the RNA, the anti-sense oligo will have an A at the same position.

In one aspect of this invention, the anti-sense oligonucleotide has a sequence which specifically binds to a portion or segment of a mRNA molecule which encodes or regulates the production of a protein associated with impeded breathing, allergy(ies), lung inflammation, depletion of lung surfactant or lowering of lung surfactant, airway obstruction, bronchitis, and the like. One effect of this binding is to reduce or even prevent the translation of the corresponding mRNA and, thereby, reduce the available amount of target protein in the subject's lung. In one preferred embodiment of this invention, the phosphodiester residues of the anti-sense oligonucleotide are modified or substituted. Chemical analogs of oligonucleotides with modified or substituted phosphodiester residues, e.g., to the methylphosphonate, the phosphotriester, the phosphorothioate, the phosphorodithioate, or the phosphoramidate, 2' methoxy ethyl and similar modifications, which increase the in vivo stability of the oligonucleotide are particularly preferred. The naturally occurring phosphodiester linkages of oligonucleotides are susceptible to some degree of degradation by cellular nucleases. Many of the residues proposed herein, on the contrary, are highly resistant to nuclease degradation. See, Milligan et al.; Cohen, J. S. D., *supra*. In another preferred embodiment of the invention, the oligonucleotides may be protected from degradation by adding a "3'-end cap" by which nuclease-resistant linkages are substituted for phosphodiester linkages at the 3' end of the oligonucleotide. See, Tidd, D. M. and Warenus, H.M., *Be. J. Cancer* 60: 343-350 (1989); Shaw, J.P. et al., *Nucleic Acids Res.* 19: 747-750 (1991), the relevant section of which are incorporated in their entireties herein by reference. Phosphoramidates, phosphorothioates, and methylphosphonate linkages all function adequately in this manner for the purposes of this invention, as do 2' modifications, such as 2' methoxy ethyl, and the like. The more extensive the modification of the phosphodiester backbone the more stable the resulting agent, and in many instances the higher their RNA affinity and cellular permeation. See, Milligan, et al., *supra*. In addition, a plurality of substitutions to the carbohydrate ring are also known to improve stability of nucleic acids. Thus, the number of residues which may be modified or substituted will vary depending on the need, target, and route of administration, and may be from 1 to all the residues, to any number in between. Many different methods for replacing the entire phosphodiester backbone with

novel linkages are known. See, Millikan et al, supra. Preferred backbone analogue residues include phosphoramidate, phosphorothioate, methylphosphonate, phosphotriester, phosphotriester, thioformacetal, phosphorodithioate, phosphoramidate, formacetal, triformacetal, thioether, carbamate, boranophosphate, 3'-thioformacetal, 5'-thioether, carbonate, C₅-substituted nucleotides, 5'-N-carbamate, sulfate, sulfonate, sulfamate, sulfonamide, sulfone, sulfite, 2'-O methyl, sulfoxide, sulfide, hydroxylamine, methylene(methylimino) (MMI), methoxymethyl (MOM), and methoxyethyl (MOE), and methyleneoxy(methylimino) (MOMI) residues, and combinations thereof. Phosphorothioate and methylphosphonate-modified oligonucleotides are particularly preferred due to their availability through automated oligonucleotide synthesis. See, Millikan et al, supra. Where appropriate, the agent of this invention may be administered in the form of their pharmaceutically acceptable salts, or as a mixture of the anti-sense oligonucleotide and its salt. In another embodiment of this invention, a mixture of different anti-sense oligonucleotides or their pharmaceutically acceptable salts is administered. A single agent of this invention has the capacity to attenuate the expression of a target mRNA and/or various agents to enhance or attenuate the activity of a pathway. By means of example, the present method may be practiced by identifying all possible deoxyribonucleotide segments which are low in thymidine (T), ribonucleotides that are low in uridine (U), or deoxynucleotide segments low in adenosine (A) of about 7 or more mononucleotides, preferably up to about 60 mononucleotides, more preferably about 10 to about 36 mononucleotides, and still more preferably about 12 to about 21 mononucleotides, in a target mRNA or a gene, respectively. This may be attained by searching for nucleotide segments within a target sequence which are low in, or lack thymidine (DNA) or uridine (RNA), a nucleotide which is complementary to adenosine, or that are low in adenosine (gene), that are 7 or more nucleotides long. In most cases, this search typically results in about 10 to 30 such sequences, i.e. naturally lacking or having less than about 40% adenosine, anti-sense oligonucleotides of varying lengths for a typical target mRNA of average length, i.e., about 1800 nucleotides long. Those with high content of T, U or A, respectively, may be fixed by substitution of a universal base for one or more As. The agent(s) of this invention may be of any suitable length, including but not limited to, about 7 to about 60 nucleotides long, preferably about 12 to about 45, more preferably up to about 30 nucleotides long, and still more preferably up to about 21, although they may be of other lengths as well, depending on the particular target and the mode of delivery. The agent(s) of the invention may be directed to any and all segments of a target RNA. One preferred group of agent(s) includes those directed to an mRNA region containing a junction between an intron and an exon. Where the agent is directed to an intron/exon junction, it may either entirely overlie the junction or it may be sufficiently close to the junction to inhibit the splicing-out of the intervening exon during processing of precursor mRNA to mature mRNA, e.g. with the 3' or 5' terminus of the anti-sense oligonucleotide being positioned within about, for example, within about 2 to 10, preferably about 3 to 5, nucleotide of the intron/exon junction. Also preferred are anti-sense oligonucleotides which overlap the initiation codon, and those near the 5' and 3' termini of the coding region. The flanking regions of the exons may also be targeted as well as the spliced segments in the precursor mRNAs. The mRNA sequences of the adenosine receptors and of many other targets are derived from the DNA base sequence of the gene expressing either receptors, e. g. the adenosine receptors, the enzymes, factors, or other targets associated with airway disease. For example, the sequence of the genomic human A₁ adenosine receptor is known and is disclosed in U.S. Patent No. 5,320,963 to Stiles, G., et al. The A₃ adenosine receptor has been cloned, sequenced and expressed in rat (see, Zhou, F., et al., P.N.A.S. (USA) 89: 7432 (1992)) and human (see, Jacobson, M. A., et al., U.K. Patent Application No. 9304582.1 (1993)). The sequence of the adenosine A_{2b} receptor gene is also known. See, Salvatore, C. A., Luneau, C. J., Johnson, R. G. and Jacobson, M., Genomics (1995), the relevant portion of which is hereby incorporated in its entirety by reference. The sequences of many of the remaining exemplary target genes are also known. See, GenBank, NIH. The sequences of those genes whose sequences are not yet available may be obtained by isolating the target segments applying technology known in the art. Once the sequence of the gene, its RNA and/or the protein are known, an anti-sense oligonucleotides may be produced according to this invention as described above to reduce the production of the targeted protein in accordance with standard techniques. The sequences for the adenosine A_{2a}, bradykinin, and other genes as well as methods for preparation of oligonucleotides are also known as those of many other target genes and mRNAs for which this invention is suitable. Thus, anti-sense oligonucleotides that downregulate the production of target sequences associated with airway disease, including the adenosine A₁, A_{2a}, A_{2b}, A₃, bradykinin, GATA-3, COX-2, and many other receptors, may be produced in accordance with standard techniques. Examples of diseases and conditions which are suitably treated by the present method are diseases and conditions, including Acute Respiratory Distress Syndrome (ARDS), asthma, adenosine administration e.g. in the

treatment of SupraVentricular Tachycardia (SVT) and other arrhythmias, and in stress tests to hyper-sensitized individuals, ischemia, renal damage or failure induced by certain drugs, infantile respiratory distress syndrome, pain, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema, chronic obstructive pulmonary disease (COPD), pulmonary transplantation rejection, pulmonary infections, and cancers such as leukemias, lymphomas, carcinomas, and the like, including colon cancer, breast cancer, lung cancer, pancreatic cancer, hepatocellular carcinoma, kidney cancer, melanoma, hepatic metastases, etc., as well as all types of cancers which may metastasize or have metastasized to the lung(s), including breast and prostate cancer.

The adenosine receptors discussed above are mere examples of the high power of the inventor's technology. In fact, a large number of genes may be targeted in a similar manner by the present agent(s), to reduce or down-regulate protein expression. This targeting may be attained by selecting a single target, or multiple targets. In the latter case, the oligos targeted to different sequences may be mixed for their administration or they may be multiple targeted anti-sense oligos (MTAs) in accordance with one embodiment of this invention; that is, the MTA sequence binds to more than one target polynucleotide, be it DNA or RNA. By means of example, if the target disease or condition is one associated with impeded or reduced breathing, bronchoconstriction, chronic bronchitis, pulmonary bronchoconstriction and/or hypertension, chronic obstructive pulmonary disease (COPD), pulmonary transplantation rejection, pulmonary infections, allergy, asthma, cystic fibrosis, respiratory distress syndrome, cancers, which either directly or by metastasis afflict the lung, the present method may be applied to a list of potential target mRNAs, which includes the targets listed in Table 1 and Table 2 below, among others. The anti-sense agent(s) of the invention have a low A content to prevent its liberation upon in vivo degradation of the agent(s). For example, if the system is the pulmonary or respiratory system, a large number of genes is involved in different functions, including those listed in Table 1 below.

Table 1: Pulmonary and Inflammatory Targets

	NFκB Transcription Factor	Interleukin-8 Receptor (IL-8 R)
	Interleukin-5 Receptor (IL-5R)	Interleukin-4 Receptor (IL-4R)
25	Interleukin-3 Receptor (IL-3R)	Interleukin-1β (IL-1β)
	Interleukin-1β Receptor (IL-1βR)	Eotaxin
	Tryptase	Major Basic Protein
	β2-adrenergic Receptor Kinase	Endothelin Receptor A
	Endothelin Receptor B	Preproendothelin
30	Bradykinin B2 Receptor (B2BR)	IgE (High Affinity Receptor)
	Interleukin-1 (IL-1)	Interleukin 1 Receptor (IL-1 R)
	Interleukin-9 (IL-9)	Interleukin-9 Receptor (IL-9 R)
	Interleukin-11 (IL-11)	Interleukin-11 Receptor (IL-11 R)
	Inducible Nitric Oxide Synthase	Cyclooxygenase (COX)
35	Intracellular Adhesion Molecule 1 (ICAM-1)	Vascular Cellular Adhesion Molecule
	Substance P	(VCAM)
	Rantes	Endothelial Leukocyte Adhesion Molecule Endothelin ETA Receptor
		(ELAM-1)
	Cyclooxygenase-2 (COX-2)	GM-CSF, Endothelin-1
40	Monocyte Activating Factor	Neutrophil Chemotactic Factor
	Neutrophil Elastase	Defensin 1,2,3
	Muscarinic Acetylcholine Receptors	Platelet Activating Factor
	Tumor Necrosis Factor α	5-lipoxygenase
	Phosphodiesterase IV	Substance P
45	Substance P Receptor	Histamine Receptor
	Chymase	CCR-1 CC Chemokine Receptor
	Interleukin-2 (IL-2)	Interleukin-4 (IL-4)
	Interleukin-12 (IL-12)	Interleukin-5 (IL-5)
	Interleukin-6 (IL-6)	Interleukin-7 (IL-7)
50	Interleukin-8 (IL-8)	Interleukin-12 Receptor (IL-12R)
	Interleukin-7 Receptor (IL-7R)	Interleukin-1 (IL-1)

	Interleukin-14 Receptor (IL-14R)	Interleukin-14
	CCR-2 CC Chemokine Receptor	CCR-3 CC Chemokine Receptor
	CCR-4 CC Chemokine Receptor	CCR-5 CC Chemokine Receptor
	Prostanoid Receptors	GATA-3 Transcription Factor
5	Neutrophil Adherence Receptor	MAP Kinase
	Interleukin-15 (IL-15)	Interleukin-15 Receptor (IL-15R)
	Interleukin-11 (IL-11)	Interleukin-11 Receptor (IL-11R)
	NFAT Transcription Factors	STAT 4
	MIP-1 α	MCP-2
10	MCP-3	MCP-4
	Cyclophillin (A, B, etc.)	Phospholipase A2
	Basic Fibroblast Growth Factor	Metalloproteinase
	CSBP/p38 MAP Kinase	Tryptase Receptor
	PDG2	Interleukin-3 (IL-3)
15	Interleukin-10 (IL-10)	Cyclosporin A - Binding Protein
	FK506-Binding Protein	$\alpha 4 \beta 1$ Selectin
	Fibronectin	$\alpha 4 \beta 7$ Selectin
	cMad CAM-1	LFA-1 (CD11a/CD18)
	PECAM-1	LFA-1 Selectin
20	C3bi	PSGL-1
	E-Selectin	P-Selectin
	CD-34	L-Selectin
	p150,95	Mac-1 (CD11b/CD18)
	Fucosyl transferase	VLA-4
25	STAT-1	STAT-2
	CD-18/CD11a	CD11b/CD18
	ICAM2 and ICAM3	C5a
	CCR3 (Eotaxin Receptor)	CCR1, CCR2, CCR4, CCR5
	LTB-4	AP-1 Transcription Factor
30	Protein kinase C	Cysteinyl Leukotriene Receptor
	Tachykinin Receptors (tach R)	I κ B Kinase 1 & 2
	Interleukin-2 Receptor (IL-2R)	(e.g., Substance P, NK-1 & NK-3 Receptors)
	STAT 6	c-mas
	NF-Interleukin-6 (NF-IL-6)	Interleukin-10 Receptor (IL-10R)
35	Interleukin-3 (IL-3)	Interleukin-2 Receptor (IL-2R)
	Interleukin-13 (IL-13)	Interleukin-12 Receptor (IL-12R)
	Interleukin-14 (IL-14)	Interleukin-6 Receptor (IL-6R)
	Interleukin-16 (IL-16)	Interleukin-13 Receptor (IL-13R)
	Medullasin	Interleukin-16 Receptor (IL-16R)
40	Adenosine A ₁ Receptor (A ₁ R)	Tryptase-I
	Adenosine A _{2b} Receptor (A _{2b} R)	Adenosine A ₃ Receptor (A ₃ R)
	β Tryptase	STAT-3
	Adenosine A _{2a} Receptor (A _{2a} R)	IgE Receptor β Subunit (IgE R β)
	Fc-epsilon receptor CD23 antigen	IgE Receptor α Subunit (IgE R α)
45	IgE Receptor Fc Epsilon Receptor (IgE R Fc ϵ R)	Substance P Receptor
	Histidine decarboxylase	Tryptase-1
	Prostaglandin D Synthase	Eosinophil Cationic Protein
	Eosinophil Derived Neurotoxin	Eosinophil Peroxidase
	Endothelial Nitric Oxide Synthase	Endothelial Monocyte Activating Factor
50	Neutrophil Oxidase Factor	Cathepsin G
	Macrophage Inflammatory Protein-1-Alpha/Rantes Receptor	Interleukin-8 Receptor α Subunit (IL-8 R α)
		Endothelin Receptor ET-B

	H2A histone family, member N	Tubulin, beta polypeptide
	ELL gene (11-19 lysine-rich leukemia gene)	7-dehydrocholesterol reductase
	ADP-ribosylation factor-like 7	Karyopherin alpha 2 (RAG cohort 1, importin alpha 1)
	EST (AI038433)	EST (AI122689)
5	EST (AI092623)	ESTs (AI095492)
	ESTs (AI138216)	ESTs (AI128305)
	ESTs (AI125228)	ESTs (AI041482)
	ESTs (AI051839)	Homo sapiens mRNA; cDNA DKFZp434A1716
	ESTs (AI096522)	ESTs (AI122807)
10	ESTs (AI041212)	EST (AI125651)
	Enolase 1, (alpha)	EST (AI024215)
	EST (AI034360)	Homo sapiens mRNA; cDNA DKFZp564H0764
	Homo sapiens mRNA for KIAA1363 protein, partial cds	
	Potassium voltage-gated channel, shaker-related subfamily, beta member 2	
15	ER-associated DNAJ; ER-associated Hsp40 co-chaperone; hDj9; ERj3	
	ESTs, Weakly similar to p38 protein [H.sapiens] (AA906703)	
	CGI-142	ESTs (AA463249)
	Homo sapiens clone 25058 mRNA sequence	ESTs (R49144)
	Squamous cell carcinoma antigen 1	ESTs (AA425700)
20	Myosin X	ESTs (AA459692)
	Epithelial protein lost in neoplasm beta	CD44 antigen (homing function and Indian blood group system)
	Coagulation factor III (thromboplastin, tissue factor)	
	ESTs (AA909635)	Adducin 1 (alpha)
	5' Nucleotidase (CD73)	
25	ESTs, Moderately similar to semaphorin C [M.musculus] (AA293300)	
	ESTs (AA278764)	ESTs (AA678160)
	Calmodulin 2 (phosphorylase kinase, delta)	ESTs (R42770)
	Chloride intracellular channel 1	High-mobility group (nonhistone chromosomal) protein 17
	Ubiquitin carrier protein	Tubulin, alpha 1 (testis specific)
30	Transglutaminase 2 (C polypeptide, protein-glutamine-gamma-glutamyltransferase)	
	Sparc/osteonectin, cwcv and kazal-like domains proteoglycan (testican)	
	Proteasome (prosome, macropain) 26S subunit, non-ATPase, 2	
	Tubulin, beta polypeptide	Filamin B, beta (actin-binding protein-278)
	Stanniocalcin	
35	Low density lipoprotein receptor (familial hypercholesterolemia)	
	Plectin 1, intermediate filament binding protein, 500kD	
	S100 calcium-binding protein A2	Immediate early response 3
	Calpain, large polypeptide L2	Pleckstrin homology-like domain, family A, member 1
	Melanoma adhesion molecule	
40	CD44 antigen (homing function and Indian blood group system)	
	Programmed cell death 5	Hexokinase 1
	Vascular endothelial growth factor	Integrin, alpha 2 (CD49B, alpha 2 subunit of VLA-2 receptor)
	Calumenin	Syntaxin 11
	Diphtheria toxin receptor (heparin-binding epidermal growth factor-like growth factor)	
45	Fn14 for type I transmembrane protein	Nef-associated factor 1
	High-mobility group (nonhistone chromosomal) protein isoforms I and Y	
	Catechol-O-methyltransferase	C-terminal binding protein 1
	Collagen, type XVII, alpha 1	ESTs (N58473)
	Farnesyl-diphosphate farnesyltransferase 1	RNA helicase-related protein
50	Interferon stimulated gene (20kD)	
	Steroid-5-alpha-reductase, alpha polypeptide 1 (3-oxo-5 alpha-steroid delta 4-dehydrogenase alpha 1)	
	Prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase)	

- Laminin, alpha 3 (nicein (150kD), kalinin (165kD), BM600 (150kD), epilegrin)
 Collagen, type XVII, alpha 1 Keratin 18
 Heparan sulfate (glucosamine) 3-O-sulfotransferase 1
 Tubulin, alpha 2 Adenylyl cyclase-associated protein
 5 Forkhead box D1 Cathepsin C
 ESTs, Highly similar to AF151802_1 CGI-44 protein [H.sapiens] (T74688)
 Ribonucleotide reductase M2 polypeptide
 Laminin, gamma 2 (nicein (100kD), kalinin (105kD), BM600 (100kD), Herlitz junctional epidermolysis bullosa))
 Homo sapiens mRNA; cDNA DKFZp586P1622 (from clone DKFZp586P1622)
 10 ESTs, Weakly similar to /prediction (AA284245)
Lactate dehydrogenase A

Note that in the parantheses after "EST(s)" is GENABNK ASESSION NO.

- These genes, and others, are involved in the normal functioning of respiration as well as in diseases associated with respiratory pathologies, including cystic fibrosis, asthma, pulmonary hypertension and
 15 vasoconstriction, chronic obstructive pulmonary disease (COPD), pulmonary transplantation rejection, pulmonary infections, chronic bronchitis, respiratory distress syndrome (ARDS), allergic rhinitis, lung cancer and lung metastatic cancers and other airway diseases, including those with inflammatory response.

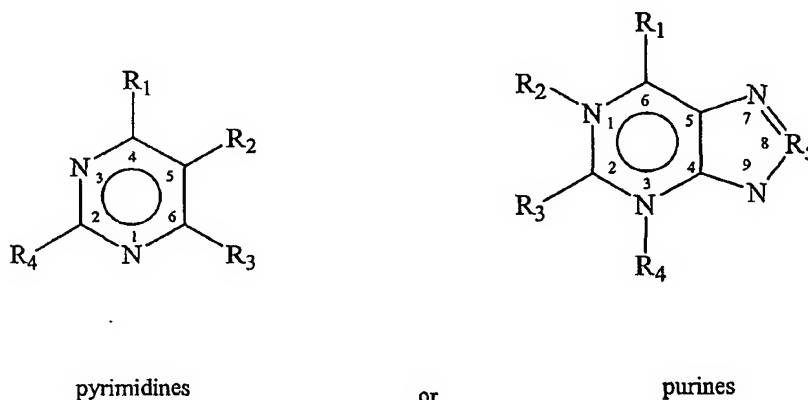
- Anti-sense oligos to the target receptors, e. g. the adenosine A₁, A_{2a}, A_{2b}, and A₃ receptors, CCR3 (chemokine receptors), bradykinin 2B, VCAM (vascular cell adhesion molecule), and eosinophil receptors, among
 20 others, have been shown to be effective in down-regulating the expression of their genes. Some of these act to alleviate the symptoms or reduce respiratory ailments and/or inflammation, for example, by "down regulation" of the adenosine A₁, A_{2a}, A_{2b}, and/or A₃ receptors and CCR3, bradykinin 2B, VCAM (vascular cell adhesion molecule) and eosinophil receptors. These agents may be utilized by the present method alone or in conjunction with anti-sense oligos targeted to other genes to validate pathway and/or networks in which they are involved. For better
 25 results, the oligos are preferably administered directly into the respiratory system, e.g., by inhalation or other means, of the experimental animal, so that they may reach the lungs without widespread systemic dissemination. This permits the use of low agent doses as compared with those administered systemically or by other generalized routes and, consequently, reduces the number and degree of undesirable side effects resulting from the agent's widespread distribution in the body. The agent(s) of this invention has (have) been shown to reduce the amount of receptor protein expressed by the tissue. These agents, thus, rather than merely interacting with their targets, e.g. a receptor,
 30 lower the number of target proteins that other drugs may interact with. In this manner, the present agent(s) afford(s) extremely high efficacy with low toxicity. Anti-sense oligonucleotides to the A₁, A_{2b}, A₃, bradykinin B2, GATA-3, VCAM (vascular cell adhesion molecule), eosinophil receptors, and COX-2 receptors, among others, have been shown to be effective in the down-regulation of the respective receptor proteins in the cell. One novel feature of this
 35 treatment, as compared to traditional treatments for adenosine-mediated bronchoconstriction, is that administration is direct to the lungs, or in situ to other tissues, organs or systems of the body. Additionally, a receptor protein itself is reduced in amount, rather than merely interacting with a drug, and toxicity is reduced. Other proteins that may be targeted with anti-sense agents for the treatment of lung conditions include, but are not limited to: CCR3 (chemokine) receptors, human A_{2a} adenosine receptor, human A_{2b} adenosine receptor, human IgE receptor β , human
 40 Fc-epsilon receptor CD23 antigen, human histidine decarboxylase, human beta tryptase, human tryptase-I, human prostaglandin D synthase, human cyclooxygenase-2, human eosinophil cationic protein, human eosinophil derived neurotoxin, human eosinophil peroxidase, human intercellular adhesion molecule-1 (ICAM-1), human vascular cell adhesion molecule-1 (VCAM-1), human endothelial leukocyte adhesion molecule-1 (ELAM-1), human P selectin, human endothelial monocyte activating factor, human IL-3, human IL-4, human IL-5, human IL-6, human IL-8,
 45 human monocyte-derived neutrophil chemotactic factor, human neutrophil elastase, human neutrophil oxidase factor, human cathepsin G, human defensin 1, human defensin 3, human macrophage inflammatory protein-1-alpha, human muscarinic acetylcholine receptor HM3, human fibronectin, human GM-CSF, human tumor necrosis factor α , human leukotriene C4 synthase, human major basic protein, and human endothelin 1. Although not intended to be exclusive, a more extensive list of genes and sequences are provided below. Some of these act to alleviate the
 50 symptoms or reduce respiratory ailments and/or inflammation, for example, by "down regulation" of the adenosine A₁, A_{2a}, A_{2b}, and/or A₃ receptors and CCR3, bradykinin 2B, VCAM (vascular cell adhesion molecule) and eosinophil receptors. These agents are preferably administered directly into the respiratory system, e.g., by

inhalation or other means, so that they may reach the lungs without widespread systemic dissemination. This permits the use of substantially lower doses of the agent of the invention as compared with those administered by the prior art, systemically or by other generalized routes and, consequently, reduce undesirable side effects resulting from the agent's widespread distribution in the body. The agent(s) of this invention has (have) been shown to reduce the amount of receptor protein expressed by the tissue. These agents, thus, rather than merely interacting with their targets, e.g. a receptor, lower the number of target proteins that other drugs may interact with. In this manner, the present agent(s) afford(s) extremely high efficacy with low toxicity. In these latter targets, and in target genes in general, it is particularly imperative to eliminate or reduce the adenosine content of the corresponding anti-sense oligonucleotide to prevent their breakdown products from liberating adenosine.

As used herein, the term "treat" or "treating" refers to a treatment which decreases the likelihood that the subject administered such treatment will manifest symptoms of the respiratory, lung or other diseases. The term "downregulate" refers to inducing a decrease in production, secretion or availability (and thus a decrease in concentration) of the targeted intracellular protein. The present invention is concerned primarily with the treatment of human subjects. However, the agents and methods disclosed here may also be employed for veterinary purposes, such as is the case in the treatment of other mammals, such as cattle, horses, wild animals, zoo animals, and domestic animals, e. g. dogs and cats. Targeted proteins may be prokaryotic or eukaryotic or mammalian and more preferably of the same species as the subject being treated. In general, "anti-sense" refers to the use of small, synthetic oligonucleotides, resembling single-stranded DNA, to inhibit gene expression by inhibiting the function of the target messenger RNA (mRNA). Milligan, J. F. et al., *J. Med. Chem.* 36(14), 1923-1937 (1993). In the present invention, inhibition of gene expression of the A₁ or A₃ adenosine receptor is desired. Gene expression is inhibited through hybridization to coding (sense) sequences in a specific messenger RNA (mRNA) target by hydrogen bonding according to Watson-Crick base pairing rules. The mechanism of anti-sense inhibition is that the exogenously applied oligonucleotides decrease the mRNA and protein levels of the target gene or cause changes in the growth characteristics or shapes of the cells. Id. See, also Helene, C. and Toulme, J., *Biochim. Biophys. Acta* 1049, 99-125 (1990); Cohen, J. S. D., Ed., *Oligodeoxynucleotides as Anti-sense Inhibitors of Gene Expression*; CRC Press: Boca Raton, FL (1987). As used herein, "anti-sense oligonucleotide" is defined as a short sequence of synthetic nucleotide that (1) hybridizes to any sense or anti-sense sequence in a mRNA or DNA which codes for the targeted protein or their double stranded counterparts, according to in vitro or in vivo hybridization conditions, described below, and (2) upon hybridization causes a decrease in gene expression of the target, e.g. adenosine or other receptor(s). The receptors discussed above are mere examples of the high power of the present technology. In fact, a large number of genes and mRNAs may be targeted in a similar manner by the present methods, to significantly down-regulate or obliterate their protein expression and observe any changes wrought to one or more functions within a system, e.g. the respiratory system and other lung disease associated targets. By means of example, in the respiratory system, the targets may be associated with difficulties of breathing, bronchoconstriction, inflammation, allergic rhinitis, chronic bronchitis, surfactant depletion, and others associated with diseases and conditions such as chronic obstructive pulmonary disease (COPD), pulmonary transplantation rejection, pulmonary infections, inhalation burns, Acute Respiratory Distress Syndrome (ARDS), cystic fibrosis, pulmonary fibrosis, radiation pneumonitis, tonsillitis, emphysema, dental pain, oral inflammation, joint pain, esophagitis, cancers afflicting the respiratory system either directly such as lung cancer, esophageal cancer, and the like, or indirectly by means of metastases, among others. These functions are of great interest because of their association with respiratory dysfunction, as is the case in asthma, allergies, allergic rhinitis, pulmonary bronchoconstriction and hypertension, chronic obstructive pulmonary disease (COPD), pulmonary transplantation rejection, pulmonary infections, allergy, asthma, cystic fibrosis (CF), Acute Respiratory Distress Syndrome (ARDS) as well as infantile and pregnancy-related RDS, cancer, etc., which either directly or by metastasis afflict the lung, the present anti-sense oligonucleotides may be directed to a list of target mRNAs, which includes the targets listed in Table 1 above, among others.

Oligonucleotides, whether DNA or RNA, may be synthesized by methods known in the art that need not be further described here. The low adenosine oligos of this invention may be obtained by first selecting fragments of a target nucleic acid having at least 4 contiguous nucleic acids selected from the group consisting of G and C and/or having a specific type and/or extent of activity, and then obtaining a first oligonucleotide 4 to 60 nucleotides long which comprises the selected fragment and has a thymidine (T) or uridine (U) nucleic acid content of up to and including about 15%, preferably, about 12%, about 10%, about 7%, about 5%, about 3%, about 1%, and more

preferably no thymidine or uridine. In one preferred embodiment, oligo(s) have a higher than natural content of Cs and Gs (orCpGs) to produce immunostimulation. The latter step may be conducted by obtaining a second oligonucleotide 4 to 60 nucleotides long comprising a sequence which is anti-sense to the selected fragment, the second oligonucleotide having an adenosine base content of up to and including about 15%, preferably about 12%, about 10%, about 7%, about 5%, about 3%, about 1%, and more preferably no adenosine. When the selected fragment comprises at least one thymidine or uridine base, an adenosine base may be substituted in the corresponding anti-sense nucleotide fragment with a universal base selected from the group consisting of heteroaromatic bases which bind to a thymidine or uridine base but have less than about 10%, preferably less than about 1%, and more preferably less than about 0.3% of the adenosine base agonist activity at the adenosine A₁, A_{2a}, A_{2b} and A₃ receptors, and heteroaromatic bases which have no activity at the adenosine A_{2a} receptor, when validating in the respiratory system. Other adenosine activities in other systems may be determined in other systems, as appropriate. The analogue heteroaromatic bases may be selected from all pyrimidines and purines, which may be substituted by O, halo, NH₂, SH, SO, SO₂, SO₃, COOH and branched and fused primary and secondary amino, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, alkoxy, alkenoxy, acyl, cycloacyl, arylacyl, alkynoxy, cycloalkoxy, aroyl, arylthio, arylsulfoxyl, halocycloalkyl, alkylcycloalkyl, alkenylcycloalkyl, alkynylcycloalkyl, haloaryl, alkylaryl, alkenylaryl, alkynylaryl, arylalkyl, arylalkenyl, arylalkynyl, arylcycloalkyl, which may be further substituted by O, halo, NH₂, primary, secondary and tertiary amine, SH, SO, SO₂, SO₃, cycloalkyl, heterocycloalkyl and heteroaryl. The pyrimidines and purines may be substituted at all positions as is known in the art, but preferred are purines that are substituted at positions 1, 2, 3, 6 and/or 8, and pyrimidines that are substituted at 2, 3, 4, 5 and/or 6. More preferred are pyrimidines and purines such as those having the chemical formula



PYRIMIDINES

wherein R¹, R², R³, R⁴, and R⁵ are independently H, alkyl, alkenyl or alkynyl and R³ is H, aryl, dicycloalkyl, dicycloalkenyl, dicycloalkynyl, cycloalkyl, cycloalkenyl, cycloalkynyl, O-cycloalkyl, O-cycloalkenyl, O-cycloalkynyl, NH₂-alkylamino-ketoxyalkyloxy-aryl, or mono or dialkylaminoalkyl-N-alkylamino-SO₂aryl, and R₄ and R₅ are independently R₁ and together are R₃, and the pyrimidines and purines optionally comprise theophylline, caffeine, dyphylline, etophylline, acephylline piperazine, bamifylline, enprofylline or xantine, among others. Similar modifications in the sugar are also embodiments of this invention. Reduced adenosine content of the anti-sense oligos corresponding to the thymidines (T) present in the target DNA or uridines (U) in the target RNA serves to prevent the breakdown of the oligos into products that free adenosine into the system, e.g. the lung, brain, heart, kidney, etc., tissue environment and, thereby, to prevent any unwanted effects due to it. By means of example, the NfκB transcription factor may be selected as a target, and its mRNA or DNA searched for low thymidine (T), low uridine (U) or desthymidine (desT) or desuridine (desU) fragments. Only desU and desT segments of the mRNA or DNA are selected which, in turn, will produce desA anti-sense as their complementary strand. When a number of DNA or RNA that are desT or desU segments are found, the sequence of the anti-sense segments may be deduced. Typically, about 10 to 30 and even larger numbers of desA anti-sense sequences may be obtained. These anti-sense sequences may include some or all desA anti-sense oligonucleotide sequences

corresponding to desU or desT segments of the mRNA or DNA of the target, such as anyone of those shown in Table 1 above, in Table 2 below, and others associated with functions of the brain, cardiovascular and renal systems, and many others. For each of the original desA anti-sense oligonucleotide sequences corresponding to the target gene, e.g. the NFκB transcription factor, typically about 10 to 30 sequences may be found within the target gene or RNA which have a low content of thymidine (DNA) or uridine (RNA). In accordance with this invention, the selected fragment sequences may also contain a small number of thymidine (DNA) or uridine (RNA) nucleotides within the secondary or tertiary or quaternary sequences. In some cases, a large adenosine content may suffice to render the anti-sense oligonucleotide less active or even inactive against the target. In accordance with this invention, these so called "non-fully desA" sequences may preferably have a content of adenosine of less than about 15%, about 12%, about 10%, about 7%, about 5%, and about 2% adenosine. Most preferred is no adenosine content (0%). In some instances, however, a higher content of adenosine is acceptable and the oligonucleotides still fail to show detrimental "adenosine activity". A particular important embodiment is that where the adenosine nucleotide is "fixed" or replaced by a "universal or alternative" base that may base-pair with similar or equal affinity to two or more of the four nucleotides present in natural DNA: A, G, C, and T.

A universal or alternative base is defined in this patent as any compound, more commonly an adenosine analogue, which has substantial capacity to hybridize to thymidine or uridine, while at the same time having reduced, or substantially lacking, ability to bind adenosine receptors or other molecules through which adenosine may exert an undesirable side effect in the experimental animal or in a cell system. Alternatively, adenosine analogs which completely fail to activate, or have significantly reduce ability for activating, adenosine receptors, such as the adenosine A₁, A_{2b} and/or A₃ receptors, most preferably A₁ receptors, and those that may even act as agonists of the adenosine A_{2a} receptor, may be used. One example of a universal base is 2'-deoxyribofuranosyl-(5-nitroindole), and an artisan will know how to select others. This "fixing" step generates further novel sequences, different from those anti-sense to the ones found in nature, that permits the anti-sense oligonucleotide to bind, preferably equally well, with the target RNA. Other examples of universal or alternative bases are 2'-deoxyribosyl-(5-nitroindole). Other examples of universal bases are 3 - nitropyrrole - 2' - deoxynucleoside, 5 - nitro-indole, 2' - deoxyribosyl - (5 - nitroindole), 2'-deoxyribofuranosyl - (5-nitroindole), 2' - deoxyinosine, 2' - deoxynebularine, 6H, 8H-3,4-dihydropyrimido [4, 5 - c] oxazine - 7 - one and 2 - amino - 6-methoxy aminopurine. In addition to the above, Universal bases which may be substituted for any other base although with somewhat reduced hybridization potential, include 3 - nitropyrrole - 2' - deoxynucleoside 2' - deoxyribofuranosyl - (5 - nitroindole), 2' - deoxyinosine and 2' - deoxynebularine (Glen Research, Sterling, VA). More specific mismatch repairs may be made using "P" nucleotide, 6H, 8H - 3, 4 - dihydropyrimido [4,5 - c] [1, 2] oxazin - 7 - one, which base pairs with either guanosine (G) or adenosine (A) and "K" nucleotide, 2 - amino - 6 - methoxyaminopurine, which base pairs with either cytidine (C) or thymidine (T)-uridine (U), among others. Others that are known in the art or will become available are also suitable. See, for example, Loakes, D. and Brown, D. M., Nucl. Acids Res. 22:4039-4043 (1994); Ohtsuka, E. et al., J. Biol. Chem.260(5):2605-2608 (1985); Lin, P.K.T. and Brown, D. M., Nucleic Acids Res. 20(19):5149-5152 (1992); Nichols, R. et al., Nature 369(6480): 492-493 (1994); Rahmon, M. S. and Humayun, N. Z., Mutation Research 377 (2): 263-8 (1997); Amosova, O., et al., Nucleic Acids Res. 25 (10): 1930-1934 (1997); Loakes D. & Brown, D. M., Nucleic Acids Res. 22 (20): 4039-4043 (1994), the entire sections relating to universal bases and their preparation and use in nucleic acid binding being incorporated herein by reference. When non-fully desT sequences are found in the naturally occurring target, they typically are selected so that about 1 to 3 universal base substitutions will suffice to obtain a 100% "desA" anti-sense oligonucleotide. Thus, the present method provides either anti-sense oligonucleotides to different targets which are low in, or devoid of, A content, as well as anti-sense oligonucleotides where one or more adenosine nucleotides, e. g. about 1 to 3, or more, may be "fixed" by replacement with a "universal" or "replacement" base. Universal bases are known in the art and need not be listed herein. An artisan will know which bases may act as universal bases, and replace them for A. Table 2 below provides a selected number of targets to which the agents of the invention are effectively applied. Others, however, may also be targeted.

Table 2: Cancer Targets

Transforming Oncogenes	Therapy Targets
ras	thymidylate synthetase
src	thymidylate synthetase

	myc	dihydrofolate reductase
	bcl-2	thymidine kinase
		deoxycytidine kinase
		ribonucleotide reductase
5	Angiogenesis factors	Adhesion Molecules
	Oncogenes	Folate Pathway Enzymes
	DNA repair genes	(One Carbon Pool)
		Telomerase
		HMG CoA Reductase
10		Farnesyl Transferase
		Glucose-6-Phosphate Transferase Akt2 (Bases 1-1715)
	Akt3 (1-1547)	
	Ampiregulin (1-1230))	
	Ap-2 (1-1391)	
15	Ap-2 Beta	
	Ap-2 Gamma	
	Sphingomyelinase	
	Beta-2-Adrenergic Receptor	
	Beta Catenin	
20	E2F-Related Transcription Factor	
	HM bFGF	
	B-cell translocation gene 1 (BTG1)	
	cyclin-dependent kinase 2 (CDK2)	
	cyclin-dependent kinase 2 (CDK2)	
25	cyclin-dependent kinase 3 (CDK3)	
	cyclin-dependent kinase 4 (CDK4)	
	cyclin-dependent kinase 5 (CDK5)	
	c-ets-1 proto-oncogene	
	checkpoint kinase Chk1 (CHK1)	
30	type IV collagenase	
	hepatocyte growth factor receptor (c-met)	
	<u>MYB proto-oncogene protein (MYB)</u>	

A group of preferred targets for the treatment of cancer are genes associated with any of different types of cancers, or those generally known to be associated with malignancies, whether they are regulatory or involved in the production of RNA and/or proteins. Examples are transforming oncogenes, including, but not limited to, ras, src, myc, and BCL-2, among others. Other targets are those to which present cancer chemotherapeutic agents are directed to, such as various enzymes, primarily, although not exclusively, thymidylate synthetase, dihydrofolate reductase, thymidine kinase, deoxycytidine kinase, ribonucleotide reductase, and the like. The present technology is particularly useful in the treatment of cancer ailments given that traditional cancer therapies are fraught with the unresolved problem of selectively killing cancer cells while preserving normal living cells from the devastating effects of treatments such as chemotherapy, radiotherapy, and the like. The present technology provides the ability of selectively attenuating or enhancing a desired pathway or target. This approach provides a significant advantage over standard treatments of cancer because it permits the selection of a pathway, including primary, secondary and possibly tertiary targets, which are not generally expressed simultaneously in normal cells. Thus, the present agent may be administered to a subject to cause a selective increase in toxicity within tumor cells that, for instance, express all three targets while normal cells that may express only one or two of the targets will be significantly less affected or even spared. A group of preferred targets for the treatment of cancers are genes associated with different types of cancers, or those generally known to be associated with malignancies, whether they are regulatory or involved in the production of RNA and/or proteins. Examples are transforming oncogenes, including, but not limited to, ras, src, myc, and BCL-2, among others. Other targets are those to which present cancer chemotherapeutic agents are directed to, such as various enzymes, primarily, although not exclusively, thymidylate synthetase, dihydrofolate

reductase, thymidine kinase, deoxycytidine kinase, ribonucleotide reductase, and the like.

In one embodiment, at least one of the genes or mRNAs to which the oligo of the invention is targeted encodes or is involved in the regulation of a protein such as transcription factors, stimulating and activating factors, intracellular and extracellular receptors and peptide transmitters in general, interleukins, interleukin receptors, chemokines, chemokine receptors, endogenously produced specific and non-specific enzymes, immunoglobulins, antibody receptors, central nervous system (CNS) and peripheral nervous and non-nervous system receptors, CNS and peripheral nervous and non-nervous system peptide transmitters, adhesion molecules, defensins, growth factors, vasoactive peptides and receptors, and binding proteins, among others; or the mRNA is corresponding to an oncogene and other genes associated with various diseases or conditions. Examples of target proteins are eotaxin, major basic protein, preproendothelin, eosinophil cationic protein, P-selectin, STAT 4, MIP-1 α , MCP-2, MCP-3, MCP-4, STAT 6, c-mas, NF-IL-6, cyclophilins, PDG2, cyclosporin A-binding protein, FK5-binding protein, fibronectin, LFA-1 (CD11a/CD18), PECAM-1, C3bi, PSGL-1, CD-34, substance P, p150,95, Mac-1 (CD11b/CD18), VLA-4, CD-18/CD11a, CD11b/CD18, C5a, CCR1, CCR2, CCR4, CCR5, and LTB-4, among others. Others are, however, suitable, as well. In another embodiment, at least one of the mRNAs to which the oligo is targeted encodes intracellular and extracellular receptors and peptide transmitters such as sympathomimetic receptors, parasympathetic receptors, GABA receptors, adenosine receptors, bradykinin receptors, insulin receptors, glucagon receptors, prostaglandin receptors, thyroid receptors, androgen receptors, anabolic receptors, estrogen receptors, progesterone receptors, receptors associated with the coagulation cascade, adenohipophyseal receptors, adenohipophyseal peptide transmitters, and histamine receptors (HisR), among others. However others are also contemplated. The encoded sympathomimetic receptors and parasympathomimetic receptors include acetylcholinesterase receptors (AcChaseR) acetylcholine receptors (AcChR), atropine receptors, muscarinic receptors, epinephrine receptors (EpiR), dopamine receptors (DOPAR), and norepinephrine receptors (NEpiR), among others. Further examples of encoded receptors are adenosine A₁ receptor, adenosine A_{2b} receptor, adenosine A₃ receptor, endothelin receptor A, endothelin receptor B, IgE high affinity receptor, muscarinic acetylcholine receptors, substance P receptor, histamine receptor, CCR-1 CC chemokine receptor, CCR-2 CC chemokine receptor, CCR-3 CC chemokine receptor (Eotaxin Receptor), interleukin-1 β receptor (IL-1 β R), interleukin-1 receptor (IL-1R), interleukin-1 β receptor (IL-1 β R), interleukin-3 receptor (IL-3R), CCR-4 CC chemokine receptor, cysteinyl leukotriene receptors, prostanoid receptors, GATA-3 transcription factor receptor, interleukin-1 receptor (IL-1R), interleukin-4 receptor (IL-4R), interleukin-5 receptor (IL-5R), interleukin-8 receptor (IL-8R), interleukin-9 receptor (IL-9R), interleukin-11 receptor (IL-11R), sympathomimetic receptors, parasympathomimetic receptors, GABA receptors, adenosine receptors, bradykinin receptors, e.g. bradykinin B2 receptor, insulin receptors, glucagon receptors, prostaglandin receptors, thyroid receptors, androgen receptors, anabolic receptors, estrogen receptors, progesterone receptors, receptors associated with the coagulation cascade, adenohipophyseal receptors, and histamine receptors (HisR). Others are also contemplated even though not listed herein. The encoded enzymes for development of the oligos of the invention include synthetases, kinases, oxidases, phosphatases, reductases, polysaccharide, triglyceride, and protein hydrolases, esterases, elastases, and , polysaccharide, triglyceride, lipid, and protein synthases, among others. Examples of target enzymes are tryptase, inducible nitric oxide synthase, cyclooxygenase (Cox), MAP kinase, eosinophil peroxidase, β 2-adrenergic receptor kinase, leukotriene c-4 synthase, 5-lipoxygenase, phosphodiesterase IV, metalloproteinase, tryptase, CSBP/p38 MAP kinase, neutrophil elastase, phospholipase A₂, cyclooxygenase 2 (Cox-2), fucosyl transferase, chymase, protein kinase C, thymidylate synthetase, dihydrofolate reductase, thymidine kinase, deoxycytidine kinase, and ribonucleotide reductase, among others. Any enzyme associated with a disease or condition, however, is suitable as a target for this invention. Suitable encoded factors for application of this invention are, among others, Nf κ B transcription factor, granulocyte macrophage colony stimulating factor (GM-CSF), AP-1 transcription factor, GATA-3 transcription factor, monocyte activating factor, neutrophil chemotactic factor, granulocyte/macrophage colony-stimulating-factor (G-CSF), NFAT transcription factors, platelet activating factor, tumor necrosis factor α (TNF α), and basic fibroblast growth factor (BFGF). Additional factors are also within the invention even though not specifically mentioned. Suitable adhesion molecules for use with this invention include intracellular adhesion molecules 1 (ICAM-1), 2 (ICAM-2) and 3 (ICAM-3), vascular cellular adhesion molecule (VCAM), endothelial leukocyte adhesion molecule-1 (ELAM-1), neutrophil adherence receptor, mad CAM-1, and the like. Other known and unknown factors (at this time) may also be targeted herein. Among the cytokines, lymphokines and chemokines preferred are interleukin-1 (IL-1), interleukin-1 β (IL-1 β), interleukin-3 (IL-3), interleukin-4 (IL-4), interleukin-5 (IL-5), interleukin-8 (IL-8),

interleukin-9 (IL-9), interleukin-11 (IL-11), CCR-5 CC chemokine, and Rantes. Other examples include H2A histone family, member N, Tubulin, beta polypeptide, ELL gene (11-19 lysine-rich leukemia gene) 7-dehydrocholesterol reductase, ADP-ribosylation factor-like 7, Karyopherin alpha 2 (RAG cohort 1, importin alpha 1), EST (AI038433), EST (AI122689), EST (AI092623), ESTs (AI095492), ESTs (AI138216), ESTs (AI128305), ESTs (AI125228), ESTs (AI041482), ESTs (AI051839), Homo sapiens mRNA; cDNA DKFZp434A1716, ESTs (AI096522), ESTs (AI122807), ESTs (AI041212), EST (AI125651), Enolase 1, (alpha), EST (AI024215), EST (AI034360), Homo sapiens mRNA; cDNA DKFZp564H0764, Homo sapiens mRNA for KIAA1363 protein, partial cds, Potassium voltage-gated channel, shaker-related subfamily, beta member 2, ER-associated DNAJ; ER-associated Hsp40 co-chaperone; hDj9; ERj3, ESTs, Weakly similar to p38 protein [H.sapiens] (AA906703), CGI-142, ESTs (AA463249), Homo sapiens clone 25058 mRNA sequence ESTs (R49144), Squamous cell carcinoma antigen 1, ESTs (AA425700), Myosin X, ESTs (AA459692), Epithelial protein lost in neoplasm beta, CD44 antigen (homing function and Indian blood group system), Coagulation factor III (thromboplastin, tissue factor), ESTs (AA909635), Adducin 1 (alpha), 5' Nucleotidase (CD73), ESTs, Moderately similar to semaphorin C [M.musculus] (AA293300), ESTs (AA278764), ESTs (AA678160), Calmodulin 2 (phosphorylase kinase, delta), ESTs (R42770), Chloride intracellular channel 1, High-mobility group (nonhistone chromosomal) protein 17, Ubiquitin carrier protein, Tubulin, alpha 1 (testis specific), Transglutaminase 2 (C polypeptide, protein-glutamine-gamma-glutamyltransferase), Sparc/osteonectin, cwcv and kazal-like domains proteoglycan (testican), Proteasome (prosome, macropain) 26S subunit, non-ATPase, 2, Tubulin, beta polypeptide, Filamin B, beta (actin-binding protein-278), Stanniocalcin, Low density lipoprotein receptor (familial hypercholesterolemia), Plectin 1, intermediate filament binding protein, 500kD, S100 calcium-binding protein A2, Immediate early response 3, Calpain, large polypeptide L2, Pleckstrin homology-like domain, family A, member 1, Melanoma adhesion molecule, CD44 antigen (homing function and Indian blood group system), Programmed cell death 5, Hexokinase 1, Vascular endothelial growth factor, Integrin, alpha 2 (CD49B, alpha 2 subunit of VLA-2 receptor), Calumenin, Syntaxin 11, Diphtheria toxin receptor (heparin-binding epidermal growth factor-like growth factor), Fn14 for type I transmembrane protein, Nef-associated factor 1, High-mobility group (nonhistone chromosomal) protein isoforms I and Y, Catechol-O-methyltransferase, C-terminal binding protein 1, Collagen, type XVII, alpha 1, ESTs (N58473), Farnesyl-diphosphate farnesyltransferase 1 RNA helicase-related protein, Interferon stimulated gene (20kD), Steroid-5-alpha-reductase, alpha polypeptide 1 (3-oxo-5 alpha-steroid delta 4-dehydrogenase alpha 1), Prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase), Laminin, alpha 3 (nicein (150kD), kalinin (165kD), BM600 (150kD), epilegrin), Collagen, type XVII, alpha 1, Keratin 18, Heparan sulfate (glucosamine) 3-O-sulfotransferase 1, Tubulin, alpha 2, Adenyl cyclase-associated protein, Forkhead box D1, Cathepsin C, ESTs, Highly similar to AF151802_1 CGI-44 protein [H.sapiens] (T74688), Ribonucleotide reductase M2 polypeptide, Laminin, gamma 2 (nicein (100kD), kalinin (105kD), BM600 (100kD), Herlitz junctional epidermolysis bullosa)), Homo sapiens mRNA; cDNA DKFZp586P1622 (from clone DKFZp586P1622), ESTs, Weakly similar to /prediction (AA284245), and Lactate dehydrogenase A. Others, however, may also be targeted, as they are known to be involved in specific diseases or conditions to be treated, or for their generic activities, such as inflammation. Examples of defensins for the practice of this invention are defensin 1, defensin 2, and defensin 3, and of selectins are $\alpha 4\beta 1$ selectin, $\alpha 4\beta 7$ selectin, LFA-1 selectin, E-selectin, P-selectin, and L-selectin. Examples of oncogenes, although not an all inclusive list, are ras, src, myc, and bcBCL. Others, however, are also suitable for use with this invention.

The agents administered in accordance with this invention are preferably designed to be anti-sense to one or more target genes and/or mRNAs usually related in origin to the species to which it is to be administered, although they may be directed, to foreign sequences, e.g. of viruses. When treating humans, the agents are preferably designed to be anti-sense to a human gene or RNA. The agents of the invention encompass oligonucleotides which are anti-sense to naturally occurring DNA and/or RNA sequences, fragments thereof of up to a length of one (1) base less than the targeted sequence, preferably at least about 7 nucleotides long, oligos having only over about 0.02%, more preferably over about 0.1%, still more preferably over about 1%, and even more preferably over about 4% adenosine nucleotides, and up to about 30%, more preferably up to about 15%, still more preferably up to about 10% and even more preferably up to about 5%, adenosine nucleotide, or lacking adenosine altogether, and oligos in which one or more of the adenosine nucleotides have been replaced with so-called universal bases, which may pair up with thymidine or uridine nucleotides but fail to substantially trigger adenosine receptor activity. Examples of human sequences and fragments, which are not limiting, of anti-sense oligonucleotide of the

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GTGTCCTTCC TTGCTCTTG GTGTGCTTT GCTGTGCCCT GCCTCTCTGC GGGGGTGGCT TCCTGCCGCG TCTCTGGGCC
GTCCCGTCCC TCGGCCCCGC GCCGCGCTCG GCTCCTCTCC CTCTGGCCCG GCTCGGGGCG GGGCGGGGCG GTGGCGGGCG
GGCGCTGCCC TCGCGCGGCG GCTGGCCCTC GCTGGCCGTC GGCTGCGCGC TGCTGGCTGC CTGCTG00CC GCGCCGGGCG
CTGTCCGCTC CTGCGGGGCG TGCTCTCTGG CTGTCTCTCC GGCTCTCTCG CTGGGGTGGG GCTGGGCGCG CCGCCCGGTG
5 CTGGGGCTCC TCGGGGGGGG GGGCTCTTCC GGGCTGTCTC CTCCCGGGG GGGGGTTTCT GGCGGTGGGG GTCTTGCTG
GCCTCGGGCG TCCTGCTTGT CTGCTCTCC TTCTCTGGTC GGTTGTGGCT CGGGGCTCCG TGGGTCCCTG GCGCCCGTTT
GTGTTTGTG TTTTCCCTG GCGTCCCTGT GCGCTCTCC TCTCTTCTCT CTGCTTCTCG CTCTCTTTG TGGGGCCCTC
CCTGTGCTC TTGGTTTGG GCTTTTTC TCTCTCTCT TTTTCTGTCG TGGGCTCC GCACGCTCT TGCCACCTCC
10 TGCGCAGGGC AGCGCCTTGG GGCCAGCGCG GCTCCCGGCG CGGCCAGCAG GGCAGCCAGC AGCGCGCAGC CGACGGCCAG
CATGCTTCT CTCTGCTAC CACTCCATGG TCCCGCAGAG GCGGACAGGC GCBGCGCTC TTGCBCTC CTGCGCBGGG
CBGCGCCTTG GGGCCBGGCG CGCTCCCGG GCGGCCBGB GGGCBGCBG CBGCGCGCBG CCBGCGGCCB GCBTGTCTCC
TCCTCGGCTB CCBCTCCBTG GTCCCGCBGB GCGGBCBGG C GCTGCCGGG GGGGTGTGCG CTGGGCGCTC CCGTGTCTCG
TTCTGTCTC CCGGTCCCC CTGCTGCG GTCCTGGCC TTGCTCTCT CTCTCTCTT CCTTCCGCT CGTGGGGGCT
GCTTGGTGG GCGCTGTGCT CCGGGTCCCG GGCTTCTGG CCCTTGGCT TCATGTTGGC TAGGTGGGGC GTTCTBTGGT
15 GCTBTGGTGG GC GGG GTG GGT BGG CCG TGT CTG GGGGT GGC CBT GTT GGT TGC CTCT TGG TGG TGC GCC GGG CCG
TCT TGG CT TCT TCT CCT TCG GGC CCT CGG GCC GGT GCT TGT GGGCT CCT CCC GGG CGG CCT CCC CGG GCG GGG GGT
TCT TGG CTG GCG GGG GGG CCT CCGCT CTG TGG CTG GGC GTT CTT TGG TGT TCT GGG TGGTGG CCG GCG TGG TGG
CCT CTG TGGGG CCC GCG GCT GCB GGG GTG CCT GTC TGC TTC GTCTT TGC GCT CCC GGG CCG CCGG GTG GGT AGG
CCG TGT CTG GGGGT GGC CAT GTT GGT TGC CCG CCC GCG GCT GCA GGG G ACAGGGGCTG TAATCTTCATC
20 TGCAGGTGGC ATGCCAGTGA AATTAGATC ATCAAAATCC ACATCTGTG GATCTGTAAT ATTTGACATG TCTCTTCAG
TTTCAAGAT GTTTGATCT AACTGAAGCA CCGGCCAGGB CBGGGGCTGT BBTCTTCTB TCBCGGTGGC BTGCCBTGB
BBTTTBGTC BTCCBBBTCC CCBCTCTGTG GBTCTGTBBT BTITGBCBTG TCCTCTCTCBG TTTBCCBB TGGTTTGTB
TBBCTGBBG BCCGGCCBGG TGGCTCGGT CTCTGCCCC TGTTGTGGC GCGCTCGGT GGTGTGGCC CTGTGTGCT
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25 TCTCTCTCT CCCCAGATC CGCGACAGGC CGCAGGCAAG AACAGCGCA ACCAGGGCGC GTCCGACAG ACTTGGAGGC
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35 TTTTGTCTG TTCCGTCTG GCTGCTCGG TCTGTGTGT GGTGTGTTG TTTCTCTTG GGTGTGGCC TTGCGGTTT
GGCTGTGGG CCTTGGGGC CTGCTCTCT GGCTCCAT CCACATGATT GCTTAGATT GTGCTGTAT TCTCAGGATT
ATCACTGATT ACACATCAA CCAAGTCCAG CCAAAGGAT GCGCTGAGG AAAGGGTTT CATCTGAGG CAAATTTAG
GACBTCCB BTGTTGCTT BGBTTGTGCT TGTCTCTC BGGTTTCTC CTGTTTBCB CTGTTTBCB TCCBGGCCB
40 BBGGTGGCC TGBGGCBGG GGTTCBCTC TTGBGGCB TTTGBGGGGCTBBGT GBTCCBCTC BCTBCCCGT
TGCCCBCCB BGGGTGCB BCBTGTCCG TGTGGCBG TGCCBBGG BCBTTTGGC BGGCTGGTT CCBGGBCTGB
TTGGGTCCG BGGTGTGTT GGBGTGTT GGGGBGGCT CTBGTCCB CCGGBGGBCG TBTCTGTT CGBGCTBGG
CGGTBBGGC CTBCTBTCT TBCBCCBCC CCTCTGCBG CBGCTGCTG TCGTGGCGC TGGGGCTCBG GGTCCGGCG
TAAGATGATC CACATCACTA CCACGTGTC CACCACAGAG GTACACCAA TGACCGTGA GGCAGCTGC CAAAGGACAA
TTTGGCAGG TGGTTGACG AACTGATTG GTTCCGAGT GTTAGTGGAG ATGTTTGGG AGAGGTCTG GTCCACCGG
45 AGGAGCTTAT CCAATTCGAA GCTAGGCGT AAAGCCCTAC TATCTGTACA CAACCCCTC ATGACGAGA CTCTGTGCT
GGCGCTGGG GCTCAGGGTC CGTCTGTG TGGCGCTGG GGCTCTCT TTTGGGGCT TTTGGTGGT GTGGCTGTG
TCTGTGTGT TGCTGCCCTG GTTGTGGGG TGTGGCTTG GGGCGCTCT CTGGCTCTC CTGCTGGGC CCC GTTGBCTTG
BGBTGTGCG CGCGTCCCG TTBGGGTGG GCGCCCTAG CCAGCACTC CACTTGGGG CGGTGGCCA GCACGAACAG
CACCAGAGG AAGGGGGCG GCCCAAGG GCAGCCGCA GGCCAGGATC AGGTCTGCT CGGCCGAGA TAATGGCATT
50 CACCAGCGG CCGCCAGCG CACGCGCGC ATCCGGCCG GTTCTGACC TGACGCCCC GTCTCTTG CATTCCTGG
CCCCAGTCA TCCTCTCTT GCGCCCTT CTGGGGCAG GACGGGGT BCBTTGBGB TGTGGCGCG GTCCGTTBB
GBGTGGGCG GCCAGCCAG CCACTCCAT TGGGGCGGG TGGCGGAC GAACAGCAC CAGAGGAAG GGGCGTGGC
AGAAGGGCAG CCGCAGGCC AGGATCAGT CTGCTGCGC CGGAGATAAT GGCATTAC ACGGCGCGC CACGCGCAG
CCGCGCATCC GCGCGGGTT CTGACCTGA GCGCCGCT CTCTGGCATT CCGTGGGCC AGTCACTCT CTCCCTGCC
55 CCTTGTCTG GGCAGGACG GCGTGTGT CBTGTGCT GCGGTTGB GGTBTGGCG TCCBCCBT OCTTTTCTC
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CGCGGTGGC CATAGCCGGC TGCTGGATC TCTCTCTG GTTGGGACT CCCCTATG TTGGCTGAA CAATCTGAGT
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TTTCCAGGCC GCTACATCG GCATCAGGT GCTCATGCC CTGGTCTCT TGCCCGGAA CCGTGTGTG ATCTGGCGG
75 TGAAGGTGAA CCAGGCGCTG CCGGATGCCA CCTTCTGCT CATCGTCTG CTGGCGGTG CTGATGTGG CCGTGGGTGCC

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	CCTCATCCTC	ACCCAGAGCT	CCATCCTGGC	CCTGTCTGGC	ATTGCTGTGG	ACCGCTACCT	CCGGGTCAAG	ATCCCTCTCC
	GGTACAAGAT	GGTGGTGACC	CCCCGGAGGG	CGCGGGTGGC	CATAGCCGGC	TGCTGGATCC	TCTCCTTGGT	GGTGGGACTG
5	CAAGTGGGAG	TTGCGTGGAA	CAATCTGAGT	GCGGTGGAGC	GGGCCTGGGC	AGCCAACGGC	AGCATGGGGG	AGCCCGTGAT
	TCCTCATGGT	CCTCATCTAC	CTGGAGGTCT	TCTACCTAAT	CCGCAAGCAG	CTCAACAAGA	AGGTGTCCGC	CTCCTCCGGC
	GACCCGCAGA	AGTACTATGG	GAAGGAGCTG	AAGATCGCCA	AGTCGCTGGC	CCTCATCCTC	TTCCTCTTTG	CCCTCAGCTG
	GCTGCCTTTG	CACATCCTCA	ACTGCATCAC	CCTCTTCTGC	CCGTCTGCCC	ACAAGCCGAG	CATCCTTACC	TACATTGCCA
10	TCTTCTAGAT	GCACGGCAAC	TCGGCCATGA	ACCCCAATTG	CTATGCCTTC	CGCATCCAGA	AGTTCGCGGT	CACCTTCCTT
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	CCCTGAGCCT	GCCCCAGCTG	GGCTGTTGGC	TGGGGGCGATG	GGGGAGGCTC	TGAAGAGATA	TGGGTCCCTC	ACGCCCTCTC
	CACCTAGGAGT	TAACCTACCT	ACACCTCTGG	GCCTGCGAGG	AGGCCTGGGA	GGGCAAGGGT	CCTACGGAGG	GACCAGGTGT
	CTAGAGGCAA	CAGTGTCTG	AGCCCCACCC	TGCCTGACCA	TCCCATGAGC	AGTCCAGCGC	TTCAGGGCTG	GGCAGGTCTT
15	GGGGAGGCTG	AGACTGCAGA	GGAGCCACCT	GGGCTGGGAG	AAGGTGCTTG	GGCTTCTGCG	GTGAGGCGAG	GGAGTCTGCT
	TGTTCTAGAT	GTGGTGGTG	CAGCCCCAGG	ACCAAGCTTA	AGGAGAGGAG	AGCATCTGCT	CTGAGACGGA	TGGAAGGAGA
	GAGGTTGAGG	ATGCACTGGC	CTGTTCTGTA	GGAGAGACTG	GCCAGAGGCA	GCTAAGGGGC	AGGAATCAAG	GAGCCTCCGT
	TCCCACTCT	GAGGACTCTG	GACCCAGGCG	CATACAGGTT	GCTAGGGTGC	CTGCTCTCCT	TGCCCTGGGC	CAGCCCAAGG
	TTGTACGTGG	GAGAGGCGAG	AAGGGTAGGT	TAAGTAATGA	TTTCTGATGA	TTTGCTGGAG	TGCTGGCTCC	ACGCCCTGGG
20	GAGTGAGCTT	GGTGGCGTAG	GTGCTGCGCT	CAAAACGCCA	CGAGGTGGTA	GCTCTGAGCC	CTCCTTCTTG	CCCTGAGCTT
	TCCGGGGAGG	AGCCTGGAGT	GTAATTACCT	GTATCTGGG	CCACCAGCTC	CACCTGGCCC	CGTGTCCGGG	CCTGGAGTGT
	CCTAGGTGAC	CCCATCTCTG	CTGCTTCTGG	GCCTGATGGA	GAGGAGAACA	CTAGACATGC	CAACTCGGGA	GCATTCTGCG
	TGCGTGGGAG	CGGGGTGGAC	GAGGGAGTGT	CTGTAAAGAG	TCAGTGTGTA	CTGTAGGCGC	CCCTGGGGTG	GGTTTAGCGAG
	GCTGCAGCAG	GCAGAGGAGG	AGTACCCCCC	TGAGAGCATG	TGGGGGAAGG	CCTTGCTGTC	ATGTGAATCC	CTCAATACCC
25	CTAGTATCTG	GCTGGGTTTT	CAGGGGCTTT	GGAAGCTCTG	TTGCAAGTGT	CCGGGGGTCT	AGGACTTTAG	GGATCTGGGA
	TCTGGGGAAG	GACCAACCCA	TGCCCTGCGA	AGCCTGGAGC	CCCTGTGTTG	GGGGGCAAGG	TGGGGGAGCC	TGGAGCCCTC
	GTGTGGGAGG	GCAGAGCGGG	GGAGCCTGGA	GCCCCCTGTG	GGGAGGGCGA	GGCGGGGGAT	CCTGGAGCCC	CTGTGTCCGG
	GGGCGAGGGA	GGGAGGTGG	CCGTCCGGTTG	ACCTTCTGAA	CATGAGTGTG	AATCCAGGA	CTTGCTTCCA	AGCCCTTCCC
	TCTGTTGGAA	ATTGGGTGTG	CCCTGGCTCC	CAAGGGAGGC	CCATGTGACT	AATAAAAAAC	TGTGAACCTT	CGCATTTTGT
30	TTTTAATAAA	AGAATCTGGA	AGATAAATAG	TCITGAAGAG	AGACAAGGA	AGGAAAAATT	AAATCCTTAG	ATTCAAGCAG
	AAGAATTCCA	TGTGGAAGGT	TTGGGTTGTT	GTGTGTGTTG	TTTGGTGTGT	TTTTTGTITT	TTTGTITTTT	TGTTTTTTTT
	TGAGATGGAG	TCTCGCTGTG	TTACCGGGAG	CGACAGAGCC	GCACGGCCGA	GTGAGTCCC	AGCCAGTAC	CATCCCTCTG
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	GGACAGAACA	GTCAGGCAGC	CGGAGGCTCT	GCCAGCTTTG	GTGACCTTGG	GTGCTTGCC	CGTGCCCTTT	GGTGCCCGTC
35	TGCTGATGTG	CCCAGCCTGT	GCCCCCATG	CCGCCCTCCA	TCTCAGCTTT	CCAGGCGGCC	TACATCGGCA	TGAGGTTGCT
	CATCGCCCTG	GTCTCTGTGC	CCGGGAACGT	GCTGGTGATC	TGGGCGGTGA	AGGTGAACCA	GGCGCTGCGG	GATGCCACCT
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50	TGCAGGAGGC	CTGGGAGGGC	AAGGGTCCCTA	CGGAGGGACC	AGGTGTCTAG	AGGCAACAGT	GTCTGAGCC	CCCACTGCC
	TGACCATCCC	ATGACGAGTC	CAGAGCTTCA	GGGCTGGGCA	GGTCTGGGG	AGGCTGAGAG	TGCAGAGGAG	CCACCTGGGC
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55	CGGCGGGTCT	CACGCGGCTG	CCCCTCGCCC	GGCGCGCCTT	CGGTAGGGGG	CGCCCGGGGC	CCAGCTGGCC	CGGCCATGCT
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60	TCCCGCTCAG	GTATAAAAGT	TTGGTCAAGG	GGACCCGAGC	AAGAGGGGTC	ATTGCTGTCC	TCTGGGTCTT	TGCCCTTGGC
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	GAATGAAAGC	GTCTGCCTTG	TGAAGTGTCT	CTTTGAGAAT	GTGGTCCCCA	TGAGCTACAT	GGTATATTTC	AATTTCTTTG
	GGTGTGTCT	GCCCCCACTG	CTTATAATGC	TGGTGTATCTA	CATTAAAGATC	TTCCTGGTGG	CCTGCAGGCA	GCTTCAGCGC
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	TGGGGTACAG	CCTGCTCTCG	GTGTGGGCTT	ATGATCTAGG	CTCTCGCCTC	TTCCAGGAGA	AGATACAAAT	CCACAAGAAA
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5 **Human Enzyme-related Antisense Polynucleotide**
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	GAGGGCCACC	ATCCTGGTGC	GCCTGGACAC	CGGAGGCCAG	GAGGGGCTGC	AGTACCAGCC	GGGGACCCAC	ATAGTGTCT
55	GCCGCCCAA	CGCGCCCGGC	CTTGTGGAGG	CGCTGTGAG	CCGGCTGGAG	GACCCGCGCG	CGCCACTGA	GCCCGTGGCA
	GTAGAGCAGC	TGGAGAAGGG	CAGCCCTGGT	GGCCCTCCCC	CCGGCTGGGT	GCGGGACCCC	CGGCTGCCCC	CGTGACAGCT
	GCGCCAGGCT	CTCACCTTCT	TCCTGGACAT	CACCTCCCCA	CCAGCCCTC	AGCTCTTGGC	GCTGCTCAGC	ACCTTGGCAG
	AAGAGCCAG	GGAACAGCAG	GAGCTGGAGG	CCCTCAGCCA	GGATCCCCGA	CGTACGAGG	AGTGGAAAGT	GTTCCTGCTG
	CCCAAGCTGC	TGGAGGTGCT	GGAGCAGTTC	CCGTCCGTGG	CGCTGCCTGC	CCCACTGCTC	CTCACCAGC	TGCTCTGCT
60	CCAGCCCGG	TACTACTCAG	TCAGCTCGGC	ACCCAGCACC	CACCCAGGAG	AGATCCACCT	CAGTGTAGCT	GTGCTGGCAT
	ACAGGACTCA	GGATGGGCTG	GGCCCCCTGC	ACTATGGAGT	CTGCTCCACG	TGGCTAAGCC	AGCTCAAGCC	CGGAGACCCT
	GTGCCCTGCT	TCATCCGGGG	GGCTCCCTCC	TTCCGGCTGC	CACCCGATCC	CAGCTTGCCC	TGCATCTGG	TGGGTCCAGG
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	GCTGGCTGCG	GAGGTGCACC	GCCTGCTGTG	CCTCGAGCGG	GGCCACATGT	TTGTCTGCGG	CGATGTTACC	ATGGCAACCA
	ACGTCTGCA	GACCGTGACG	CGCATCCTGG	CGACGAGGGG	CGACATGGAG	CTGGACGAGG	CCGGCCAGCT	CATCGCGCTG
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	CCAGAGCTTT	TCCTTGACAG	AGCGTCAAGT	CGGGGGCGCA	GTGCTCTGGG	CGTTCCGACCC	TCCCGCTCA	GACACCAACA
70	GCCCTGAGA	GCCGCTGGC	TTTCCCTTCC	AGTTCGGGA	GAGCGGCTGC	CCGACTCAGG	TCCGCGGAC	CAGGATCAGC
	CCCGCTCCTC	CCCTCTGAG	GTGGTGCCTT	CTCACATCTG	TCCAGAGGCT	GCAAGGATTC	AGCATATTTC	CTCCAGGAAG
	GAGCAAACAG	CCTCTTTTCC	CTCTTAAGGC	CTGTGTGCTC	GGGCTGGGT	CCGCCTTAAT	CTTGAAGGCC	CCTCCAGCA
	GCGGTACCCC	AGGGCTACT	GCCACCCGCT	TCCTGTTTCT	TAGTCCGAAT	GTTAGATTCC	TCTTGCTCT	CTCAGGAGTA
	TCTTACCTGT	AAAGTCTAAT	CTCTAAATCA	AGTATTTATT	ATTGAAGATT	TACCATAAGG	GACTGTGCCA	GATGTTAGGA
75	GAACCTACTAA	AGTGCCCTACC	CCAGCTC-3'	(SEQ ID NO:12372)				

Human Factor Related Anti-sense Oligonucleotide

5'-CCT CCT TCC TGG TCT GTC TGC CBG BCB BBT TTG GGB BGT GBB CBG TTT TGG BBC CBT GTT TCC CBG TCT CTG BGC
 TGT GGC GCC CTG CTG TTT CTG CT TCC CTT GGT GGG TTG GGC C GCT GGT TGT TCT GGG GTT C TTG CTG CCC CTT
 CTG TCC C TGT TTG CTG GTG TCT GCG C CCC CBB CBG BBG BBG CBG BCB BBT TTG GGB BGT GBB CBG TTT TGG BBC CBT
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 TCC BGT GBT GGT GCG GTB CTT GTC GCT GCB GCG CTC GGC CTG GTC CCG GBB BGC GCG CCG GCC GGG GGC TGC TGG G
 GGT TGG CCC GGG GTG CCC C GCC GCT GGG TGC CCT CGT CCT CTG CCG TC GTG TCT CCT GGC TCT GGT TCC CC GCT GCG
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	Human Adenosine A1 Receptor Nucleic Acid and Antisense Oligonucleotide Fragments							
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 AGCATCTGCT CTGAGACGGA TGAAGAGGAG GAGGTTGAGG ATGCATGCGC CTGTTCTGTA GGAGAGACTG TGGGGGAAGG
 GCTAAGGGGC AGGAATCAAG GAGCCTCCGT TCCCACCTCT GAGGACTCTG GACCCAGGC CATACCAAGT GCTAGGGTGC
 CTGCTCTCTT TGCCCTGGGC CAGCCAGGA TTGTACGTGG GAGAGGCAGA AAGGGTAGGT TCAGTAATCA TTCTGATGA
 TTTGCTGGAG TGCTGGCTCC ACGCCCTGGG GAGTGAAGTT GGTGCGGTAG GTGCTGGCT CAAACAGCCA CGAGGTGGTA
 45 GCTCTGAGCC CTCTTCTTG CCTGAGCTT TCCGGGAGG AGCCTGGAGT GTAAATTACCT GTATCTGGG CCACAGCTC
 CACTGGCCCC CGTTGCCGGG CCTGGAAGT CCTAGGTGAC CCCATCTCTG CTGCTTCTGG GCCTGATGGA GAGGAGAACA
 CTAGACATGC CAACTCGGGA GCATTCTGCC TGCTGGGAA CGGGGTGGAC GAGGGAGTGT CTGTAAGGAC TCAGTGTGTA
 CTGTAGGCGC CCTTGGGGT GGTTTAGCAG GCTGCAGCAG CAGAGGAGG AGTACCCCC TGAGAGACTG TGGGGGAAGG
 CCTTGTCTG ATGTGAATCC CTCAATACCC CTAGTATCTG GCTGGGTTTT CAGGGGCTTT GGAAGCTCTG TTGCAAGTGT
 50 CCGGGGTCT AGGACTTTAG GGATCTGGGA TCTGGGGAAG GACCAACCCA TGCCCTGCCA AGCCTGAGC CCTGTGTTG
 GGGGCAAGG TGGGGGAGCC TGGAGCCCT GTGTGGGAG GCGAGGCGG GGAGCTGGA GCCCTGTGT GGGAGGGCGA
 GGGGGGGAT CCTGGAGCCC CTGTGTCCGG GGGCGAGGGA GGGGAGGTGG CCGTGGGTTG ACCTTCTGAA CATGATGTCT
 AACTCCAGGA CTGTCTTCCA AGCCCTTCCC TCTGTTGAA ATTGGGTGTG CCCTGGCTCC CAAGGAGGC CCATGTGACT
 AATAAAAAAC TGTGAACCTT -3' (FRAG. NO.) (SEQ ID NO: 11802)
 5'- ATGCGGCCCT CCATCTCAGC TTCCAGGCC GCCTACATCG GCATCGAGGT GCTCATCGCC CTGGTCTCTG TGCCCCGGAA
 CGTGCTGGTG ATCTGGGCGG TGAAGGTGAA CCAGGCGCTG CGGATGCCA CCTTCTGCTT CATCGTCTCG CTGGCGGTGG
 CTGATGTGGC CGTGGGTGCC CTGGTATCC CCTCGCCAT CCTCATCAAC ATTGGGCCAC AGACCTACTT CCACACCTGC
 CTCATGGTTG CCTGTCCGT CCTCATCTC ACCCAGAGCT CCATCCTGGC CTGTGTGGA ATTGTGTGG ACCGTAACCT
 CCGGTCTAAG ATCCCTCTCC GGTACAAGAT GGTGGTGACC CCGCGGAGGG CCGCGGTGGC CATAGCTGGC TCTGGATCC
 60 TCTCTTCGT GGTGGGACTG ACCCTATGT TTGGCTGAA CAATCTGAGT GCGGTGGAGC GGGCCTGGGC AGCCAACGGC
 AGCATGGGGG AGCCCGTAT CAAGTGCAGG TTCGAGAAGG TCATCAGCAT GGAGTACATG GTCTACTTCA ACTTCTTGT
 GTGGGTGCTG CCCCCTGCTC TCCTCATGTT CCTCATCTC CTGAGGTTCT TCTACCTAAT CCGCAAGCAG CTCACAAGA
 AGGTGTGGGC CTCTCCGGC GACCCGCGA AGTACTATGG GAAGGAGCTG AAGATCGCCA AGTCGCTGGC CCTCATCTC
 TTCTCTTTG CCTCAGCTG GCTGCTTTG CACATCCTCA ACTGCATCAC CCTCTTCTGC CCGTCTGCC ACAAGCCAG
 65 CATCCTTACC TACATTGCCA TCTTCTCAC GCACGGCAAC TCGGCCATGA ACCCAATTGT CTATGCTTTC CGCATCCAGA
 AGTTCGCGT CACCTTCTT AAGATTGTGA ATGACCATT CCGCTGCCAG CCGTGCACCT CCATTGACGA GGATCTCCCA
 GAAGAGAGGC CTGATGACTA G-3' (FRAG. NO.) (SEQ ID NO: 11801)
 5'-CGCATTTTGT TTTAATAAAA AGAATCTGGA AGATAAATAG TCTTGAAGAG AGACAAAGGA AGGAAAATTT AAATCCTTAG
 ATTCAAGCAG AAGAATTCCA TGTGGAAGGT TTGGGTGTTG TTGTGTTG TTGGTGTG TTTTGTGTTT TTTGTTTTTT
 70 TGTTTTTTTT TGAGATGGAG TCTCGCTGTG TTACCGGAG CGACAGAGCC GCACGCGCGA GTCGAGTCCC AGCCAGCTAC
 CATCCCTCTG GAGCTTACCG GCCGGCCTTG GCTTCCCCAG GAATCCCTGG AGCTAGCGGC TGCTGAAGGC GTCGAGGTGT
 GGGGGCAGT GGACAGAACA GTCAGGCAGC CGGAGAGCTT GCCAGCTTGG GTGACCTTGG GTGCTTGCCT TGTGCCCTT
 GGTGCCCTTC TGCTGATGTG CCCAGCTGT GCCCGCATG CCGCCTTCCA TCTCAGCTTT CCAGCCGCGC CATCATCGCA
 TCGAGGTGCT CATCGCCCTG GTCTCTGTGC CCGGAACCT GCTGGTGATC TGGGCGGTGA AGGTGAACCA GCGCTGCGG
 75 GATGCCACCT TCTGCTTCAT CGTGTGCTG GCGGTGGCTG ATGTGGCCGT GGTGCGCTG GTCATCCCCC TCGCATCCT

CATCAACATT GGGCCACAGA' CCTACTTCCA CAOCTGCCTC ATGGTTGCCCT GTCCGGTCCCT CATCCTCACC CAGAGCTCCA
 TCCTGGCCCT GCTGGCAATT GCTGTGGACC GCTACCTCCG GGTCAAGATC CCTCTCCGGT ACAAGATGGT GGTGACCCCC
 CGGAGGGCGG CGGTGGCCAT AGCCGGCTGC TGGATCCTCT CCTTCGTGCT GGGACTGACC CCTATGTTTG GCTGGAACAA
 TCTGAGTGGG GTGGAGCGGG CCTGGGCAGC CAACGGCAGC ATGGGGGAGC CCGTGATCAA GTGCGAGTTC GAGAAGGTCA
 5 TCAGCATGGA GTACATGGTC TACTTCAACT TCTTTGTGTG GGTGCTGCC CCGCTTCTCC TCATGTGCTT CATCTACCTG
 GAGGTCTTCT ACCTAATCCG CAAGCAGCTC AACAAGAAGG TGTCCGGCTC CTCCGGCGAC CCGCAGAAGT ACTATGGGAA
 GGAGCTGAAG ATCGCCAAGT CGCTGGCCCT CATCCTCTTC CTCTTTGCC TCAGCTGGCT GCCTTTGCAC ATCCTCAACT
 GCATCACCTT CTCTGCCCCG TCCTGCCACA AGCCAGCAT CCTTACCTAC ATTGCCATCT TCCTCACGCA CGGCAACTCG
 10 GCCATGAACC CCATTGTCTA TGCTTCCGC ATCCAGAAGT TCCGCGTCAC CTTCCTTAAG ATTTGGAATG ACCATTTCGG
 CTGCCAGCCT GCACCTCCCA TTGACGAGGA TCTCCAGAA GAGAGGCCCTG ATGACTAGAC CCCGCCCTCC GCTCCACCG
 CCCACATCCA GTGGGGTCTC AGTCCAGTCC TCACATGCCG GCTGTCCAG GGGTCTCCCT GAGCCTGCC CAGCTGGGCT
 GTTGGCTGGG GGCATGGGGG AGGCTCTGAA GAGATACCCA CAGAGTGTGG TCCCTCCACT AGGAGTTAAC TACCTACAC
 CTCTGGGCCG TGCAAGGAGG CTGGGAGGGC AAGGGTCTTA CGGAGGGACC AGGTGTCTAG AGGCAACAGT GTTCTGAGCC
 CCCACCTGCC TGACCATCCC ATGAGCAGTC CAGAGCTTCA GGGCTGGGCA GGTCTGGGG AGGCTGAGAC TGCAGAGGAG
 15 CCACCTGGGC TGGGAGAAAG TGCTTGGGCT TCTGCGGTGA GGCAGGGGAG TCTGCTTGTG TTAGATGTTG GTGGTGACGC
 CCCAGGACCA AGCTTAAGGA GAGGAGACA TCTGCTCTGA GACGGATGGA AGGAGAGAGG TTGAGGATGC ACTGGCCTGT
 TCTGTAGGAG AGACTGGCCA GA -3'
 (FRAG. NO:) (SEQ ID NO:11791)
 5'-ATGAGTGTCA GAAGTGTGAA GGGTGCCTGT TCTGAATCCC AGAGCCTCCT CTCCTCTGT GAGGCTGGCA GGTGAGGAAG
 20 GGTTTAACTT CACTGGAAGG AATCCCTGGA GCTAGCGGCT GCTGAAGCGG TCGAGGTGTG GGGGCACTTG GACAGAACAG
 TCAGGACGCC GGGAGCTCTG CCAGCTTTGG TGACCTTGGG CCGGCTGGG AGCGCTGCGG CCGGAGCCGG AGGACTATGA
 GCTGCCGCGC GTTGTCAGA GCCCAGCCCA GCCCTACCGC CGCGGCCCGG AGCTCTGTTC CTTGGAAGT TGGGCACTGC
 CTCTGGGACC CTTGCCGGCC AGCAGGCAGG ATGTGTCTTG CCTGTGCCC CTGTGTGCCC GTCTGTGCTT GTGCCAGCC
 25 TGTGCCGCGC ATGCCGCCCT CCATCTCAGC TTTCCAGGCC GCCTACATCG GCATCGAGGT GCTCATCGCC CTGGTCTCTG
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 CTGGCGGTGG CTGATGTGGC CGTGGGTGCC CTGTCTCTC CCTCATCAAC ATTGGGCCAC AGACCTACTT
 CCACACTGCG CTCATGTGTT CTTGTCCGGT CCTCATCTC ACCCAAGACT CCATCCTGGC CTGTCTGGCA ATTGTCTGTTG
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 TGCTGGATCC TCTCTTCTGT GGTGGGACTG ACCCTATGT TTGGCTGGAA CAATCTGAGT GCGGTGGAGC GGGCCTGGGC
 30 AGCCAAACGGC AGCATGGGGG AGCCCGTGAT CAAGTGCAGG TCGAGAAGG TCATCAGCAT GGAGTACATG GTCTACTTCA
 ACTTCTTTGT GTGGGTGCTG CCCCCGCTTC TCCTCATGGT CCTCATCTAC CTGGAGGTCT TCTACCTAAT CCGCAAGCAG
 CTCACCAAGA AGGTGTGCGG CTCCCTCCGG GACCCCTAGA AGTACTATGG GAAGGAGCTG AAGATCGCCA AGTCCGCTGGC
 CCTCATCTCT TCTCTTTG CCTCAGCTG GCTGCCCTCA CATCTCTCA ACTGCATCA CCTCTTCTGC CCGCTCTGCC
 35 ACAAGCCAGC CACCTTACC TACATTGCCA TCTTCTCAC GCACGGCAAC TCGGCCATGA ACCCTATTGT CTATGCCTTC
 CGCATCCAGA AGTTCGCGT CACCTTCTT AAGATTGGA ATGACCATTT CCGCTGCCAG CTGCACTC CCATTGACGA
 GGATCTCCCA GAAGAGAGGC CTGATGACTA GACCCCGCT TCGCTCCCA CCAGCCACA TCCAGTGGGG TCTCAGTCCA
 GTCCTCACAT GCCCGCTGTC CCAGGGGTCT CCCTGAGCTT GACCCAGCTG GGCTGTGGC TGGGGGCTG GGGGAGGCTC
 TGAAGAGATA CCCACAGAGT GTGGTCCCTC CACTAGGAGT TAACTACCCT ACACCTCTGG GCCCTGCAGG AGGCCTGGGA
 GGGCAAGGGT CCAACGGAGG GACCAAGGTCT CTAGAGGCCA CAGTGTCTG AGCCCCACC TGCTGACCA TCCCATGAGC
 40 AGTCCAGCGC TCAAGGCTG GGCAGGTCTT GGGAGGCTG AGACTGCAGG GAGGCCACCT GGGCTGGAGC AAGGTGCTTG
 GGCTTCTGCG GTGAGGCAGG GGAGTCTGCT TGTCTTAGAT GTTGGTGGT CAGCCCCAGG ACCAAGCTTA AGGAGAGGAG
 AGCATCTGCT CTGAGACGGA TGAAGGAGA GAGGTGAGG ATGCACTGGC CTGTTCTGTA GGAGAGACTG GCCAGGGCA
 GCTAAGGGGC AGGAATCAAG GAGCCTCCGT TCCACCTCT GAGGACTCTG GACCCAGGC CATACCAAGT GCTAGGGTGC
 CTGCTCTCTT TGCCCTGGG CAGCCAGGA TTGTCTGGG GACCCAGCTT AAGGGTAGGT TCAGTAATCA TTTCTGATGA
 45 TTTGCTGGAG TGCTGGCTCC ACGCCCTGGG GAGTGAGCTT GGTGGGTAG GTGCTGGCCT CAAACAGCCA CGAGGTGGTA
 GCTCTGAGCC CTCCTTCTTG CCCTGAGCTT TCCGGGGAGG AGCCTGGAGT GTAATTACCT GTCATCTGGG CCACAGCTC
 CACTGGCCCG CGTTGCCGGG CCTGGACTGT CCTACTCTG CCGGCTCTG GCTGCTGGG GAGGAGAACA GAGGAGGAGC
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 50 CCTTGCTGTC ATGTGAATCC CTCAATACCC CTAGTATCTG GCTGGGTTTT CAGGGGCTTT GGAAGCTCTG TTGAGGTGT
 CCGGGGCTT AGGACTTTAG GGATCTGGGA GATCTGGGAG GACCAACCCA TGCCCTGCCA AGCCTGGAGC CCCTGTGTTG
 GGGGGCAAGG TGGGGGAGCC TGGAGCCCT GTGTGGGAGG GCGAGGCGGG GAGCCTGGA GCCCTGTGT GGGAGGGCGA
 GGGGGGGAT CCGTGAGCCC CTGTGTGGG GGGCGAGGGA GGGGAGGTGG CCGTCGGTGG ACCTTCTGAA CATGAGTGT
 AACTCCAGGA CTGTCTTCCA AGCCCTTCCC TCTGTGGAA ATTGGGTGTG CCCTGGCTCC CAAGGGAGGC CCATGTGACT
 55 AATAAAAAAC TGTGAACCCT -3' (FRAG. NO:) (SEQ ID NO:11790)
 5'-ATGCCCGCCT CCATCTCAGC TTTCCAGGCC GCCTACATCG GCATCGAGGT GCTCATCGCC CTGGTCTCTG TGCCCCGGAA
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 CTGATGTGGC CGTGGGTGCC CTGGTCATCC CCTCGCCAT CCTCATCAAC ATTGGGCCAC AGACCTACTT CCACACCTGC
 CTCATGGTTG CTGTCCGGT CCTCATCTC ACCCAGAGCT CCATCCTGGC CTGCTGGCA ATTGCTGTGG ACCGCTACCT
 60 CCGGGTCAAG ATCCCTCTCC GGTACAAGAT GGTGGTGACC CCGCGAGGG CCGCGGTGGC CATAGCCGGC TGCTGGATCC
 TCTCCTTCTG GGTGGGACTG CCCCTATGT TTGGCTGGAA CAATCTGAGT GCGGTGGAGC GGGCCTGGG AGCCAACGGC
 AGCATGGGGG AGCCCGTGAT CAAGTGCAGG TCGAGAAGG TCATCAGCAT GGAGTACATG GTCTACTTCA ACTTCTTTGT
 GTGGGTGCTG CCCCCGCTTC TCCTCATGGT CCTCATCTAC CTGGAGGTCT TCTACCTAAT CCGCAAGCAG CTCACCAAGA
 AGGTGTGCGC CTCTCCGGC GACCCGAGGA AGTACTATGG GAAGGAGCTG AAGATCGCCA AGTCCGCTGGC CCTCATCTC
 65 TTCTCTTTG CCCTCAGCTG GCTGCTTTG CACATCTTCA ACTGCATCAC CCTTCTGCT CCGTCTGCC ACAAGCCCAO
 CATCCTTACC TACATTGCCA TCTTCTCAC GCACGGCAAC TCGGCCATGA ACCCATTTGT CTATGCCTTC CGCATCCAGA
 AGTTCGCGT CACCTCTCTT AAGATTGGA ATGACCATTT CCGTGCCAG CCGTGCACCT CCATTGACGA GGATCTCCCA
 GAAGAGAGGC CTGATGACTA G (FRAG. NO:) (SEQ ID NO:12483)
 5'-GAT GGA GGG CGG CAT GGC GGG-3' (FRAG. NO: 1657) (SEQ ID NO:11781)
 70 5'-G CGG GTC GCC GG-3' (FRAG. NO: 1658) (SEQ ID NO:11782)
 5'-GGC GGG CBC BGG C-3' (FRAG. NO: 1659) (SEQ ID NO:11783)
 5'-GGC GGG CBC-3' (FRAG. NO: 1660) (SEQ ID NO:11784)
 5'-GC GGC CTG G-3' (FRAG. NO: 1661) (SEQ ID NO:11785)
 5'-GGB GGG CGG C-3' (FRAG. NO: 1662) (SEQ ID NO:11786)
 75 5'-GBT GGB GGG-3' (FRAG. NO: 1663) (SEQ ID NO:11787)

5-GG CTG GGC-3' (FRAG.NO: 1664) (SEQ ID NO:11788)
5-GC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG.1) (SEQ ID NO:9380)
5-C GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3'(FRAG 2) (SEQ. ID NO:12)
5-GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3'(FRAG 3)(SEQ ID NO:9382)
5-GC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 4)(SEQ ID NO:9383)
5-C CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 5) (SEQ ID NO:9384)
5-CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 6) (SEQ ID NO:9385)
5-TG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 7) (SEQ ID NO:9386)
5-G GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 8) (SEQ ID NO:9387)
5-GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 9) (SEQ ID NO:9388)
5-AA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 10) (SEQ ID NO:9389)
5-A AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 11) (SEQ ID NO:9390)
5-AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 12) (SEQ ID NO:9391)
5-GC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 13) (SEQ ID NO:9392)
5-C TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 14) (SEQ ID NO:9393)
5-TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 15) (SEQ ID NO:9394)
5-GA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 16) (SEQ ID NO:9395)
5-A GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 17) (SEQ ID NO:9396)
5-GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 18) (SEQ ID NO:9397)
5-AT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 19) (SEQ ID NO:9398)
5-T GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 20) (SEQ ID NO:9399)
5-GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 21) (SEQ ID NO:9400)
5-GA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 22) (SEQ ID NO:9401)
5-A GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 23) (SEQ ID NO:9402)
5-GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 24) (SEQ ID NO:9403)
5-GG CGG CAT TGC GGG CAC AGG CTG GGC-3' (FRAG 25) (SEQ ID NO:9404)
5-G CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 26) (SEQ ID NO:9405)
5-CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 27) (SEQ ID NO:9406)
5-GG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 28) (SEQ ID NO:9407)
5-G CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 29) (SEQ ID NO:9408)
5-CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 30) (SEQ ID NO:9409)
5-AT GGC GGG CAC AGG CTG GGC-3' (FRAG 31) (SEQ ID NO:9410)
5-T GGC GGG CAC AGG CTG GGC-3' (FRAG 32) (SEQ ID NO:9411)
5-GGC GGG CAC AGG CTG GGC-3' (FRAG 33) (SEQ ID NO:9412)
5-GC GGG CAC AGG CTG GGC-3' (FRAG 34) (SEQ ID NO:9413)
5-C GGG CAC AGG CTG GGC-3' (FRAG 35) (SEQ ID NO:9414)
5-GGG CAC AGG CTG GGC-3' (FRAG 36) (SEQ ID NO:9415)
5-GG CAC AGG CTG GGC-3' (FRAG 37) (SEQ ID NO:9416)
5-G CAC AGG CTG GGC-3' (FRAG 38) (SEQ ID NO:9417)
5-CAC AGG CTG GGC-3' (FRAG 39) (SEQ ID NO:9418)
5-AC AGG CTG GGC-3' (FRAG 40) (SEQ ID NO:9419)
5-C AGG CTG GGC-3' (FRAG 41) (SEQ ID NO:9420)
5-AGG CTG GGC-3' (FRAG 42) (SEQ ID NO:9421)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3'(FRAG 43)(SEQ ID NO:9422)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 44)(SEQ ID NO:9423)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 45)(SEQ ID NO:9424)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 46)(SEQ ID NO:9425)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 47)(SEQ ID NO:9426)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT TGC GGG CAC AGG C-3' (FRAG 48)(SEQ ID NO:9427)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 49) (SEQ ID NO:9428)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 51) (SEQ ID NO:9430)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 52) (SEQ ID NO:9431)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 53) (SEQ ID NO:9432)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT TGC GGG C-3' (FRAG 54) (SEQ ID NO:9433)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GGG -3' (FRAG 55) (SEQ ID NO:9434)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC GG-3' (FRAG 56) (SEQ ID NO:9435)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC G-3'(FRAG 57) (SEQ ID NO:9436)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GGC G-3' (FRAG 58) (SEQ ID NO:9437)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT GG -3' (FRAG 59) (SEQ ID NO:9438)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT G-3' (FRAG 60) (SEQ ID NO:9439)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CAT -3' (FRAG 61) (SEQ ID NO:9440)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG CA-3' (FRAG 62) (SEQ ID NO:9441)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG C-3' (FRAG 63) (SEQ ID NO:9442)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CGG -3' (FRAG 64) (SEQ ID NO:9443)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG CG -3' (FRAG 65) (SEQ ID NO:9444)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG C-3' (FRAG 66) (SEQ ID NO:9445)
5-GGC GGC CTG GAA AGC TGA CAT GGA GGG -3' (FRAG 67) (SEQ ID NO:9446)
5-GGC GGC CTG GAA AGC TGA CAT GGA GG -3' (FRAG 68) (SEQ ID NO:9447)
5-GGC GGC CTG GAA AGC TGA CAT GGA G-3' (FRAG 69) (SEQ ID NO:9448)
5-GGC GGC CTG GAA AGC TGA CAT GGA -3' (FRAG 70) (SEQ ID NO:9449)
5-GGC GGC CTG GAA AGC TGA CAT GG -3' (FRAG 71) (SEQ ID NO:9450)
5-GGC GGC CTG GAA AGC TGA CAT G -3' (FRAG 72) (SEQ ID NO:9451)
5-GGC GGC CTG GAA AGC TGA CAT -3' (FRAG 73) (SEQ ID NO:9452)
5-GGC GGC CTG GAA AGC TGA GA-3' (FRAG 74) (SEQ ID NO:9453)

- 5'-GGC GGC CTG GAA AGC TGA G-3' (FRAG 75) (SEQ ID NO:9454)
5'-GGC GGC CTG GAA AGC TGA-3' (FRAG 76) (SEQ ID NO:9455)
5'-GGC GGC CTG GAA AGC TG-3' (FRAG 77) (SEQ ID NO:9456)
5'-GGC GGC CTG GAA AGC T-3' (FRAG 78) (SEQ ID NO:9457)
5 5'-GGC GGC CTG GAA AGC-3' (FRAG 79) (SEQ ID NO:9458)
5'-GGC GGC CTG GAA AG-3' (FRAG 80) (SEQ ID NO:9459)
5'-GGC GGC CTG GAA A-3' (FRAG 81) (SEQ ID NO:9460)
5'-GGC GGC CTG GAA-3' (FRAG 82) (SEQ ID NO:9461)
5'-GGC GGC CTG GA-3' (FRAG 83) (SEQ ID NO:9462)
10 5'-GGC GGC CTG G-3' (FRAG 84) (SEQ ID NO:9463)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 85) (SEQ ID NO:9464)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 86) (SEQ ID NO:9465)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 87) (SEQ ID NO:9466)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 88) (SEQ ID NO:9467)
15 5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 89) (SEQ ID NO:9468)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 90) (SEQ ID NO:9469)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 91) (SEQ ID NO:9470)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 92) (SEQ ID NO:9471)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 93) (SEQ ID NO:9472)
20 5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 94) (SEQ ID NO:9473)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 95) (SEQ ID NO:9474)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 96) (SEQ ID NO:9475)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 97) (SEQ ID NO:9476)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 98) (SEQ ID NO:9477)
25 5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 99) (SEQ ID NO:9478)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 100) (SEQ ID NO:9479)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 101) (SEQ ID NO:9480)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT G -3' (FRAG 102) (SEQ ID NO:9481)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 103) (SEQ ID NO:9482)
30 5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 104) (SEQ ID NO:9483)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG C-3' (FRAG 105) (SEQ ID NO:9484)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CGG -3' (FRAG 106) (SEQ ID NO:9485)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG CG -3' (FRAG 107) (SEQ ID NO:9486)
5'-GC GGC CTG GAA AGC TGA GAT GGA GGG C -3' (FRAG 108) (SEQ ID NO:9487)
35 5'-GC GGC CTG GAA AGC TGA GAT GGA GGG -3' (FRAG 109) (SEQ ID NO:9488)
5'-GC GGC CTG GAA AGC TGA GAT GGA GG -3' (FRAG 110) (SEQ ID NO:9489)
5'-GC GGC CTG GAA AGC TGA GAT GGA G -3' (FRAG 111) (SEQ ID NO:9490)
5'-GC GGC CTG GAA AGC TGA GAT GGA -3' (FRAG 112) (SEQ ID NO:9491)
5'-GC GGC CTG GAA AGC TGA GAT GG -3' (FRAG 113) (SEQ ID NO:9492)
40 5'-GC GGC CTG GAA AGC TGA GAT G -3' (FRAG 114) (SEQ ID NO:9493)
5'-GC GGC CTG GAA AGC TGA GAT -3' (FRAG 115) (SEQ ID NO:9494)
5'-GC GGC CTG GAA AGC TGA GA-3' (FRAG 116) (SEQ ID NO:9495)
5'-GC GGC CTG GAA AGC TGA G-3' (FRAG 117) (SEQ ID NO:9496)
5'-GC GGC CTG GAA AGC TGA-3' (FRAG 118) (SEQ ID NO:9497)
45 5'-GC GGC CTG GAA AGC TG-3' (FRAG 119) (SEQ ID NO:9498)
5'-GC GGC CTG GAA AGC T-3' (FRAG 120) (SEQ ID NO:9499)
5'-GC GGC CTG GAA AGC-3' (FRAG 121) (SEQ ID NO:9500)
5'-GC GGC CTG GAA AG-3' (FRAG 122) (SEQ ID NO:9501)
5'-GC GGC CTG GAA A-3' (FRAG 123) (SEQ ID NO:9502)
50 5'-GC GGC CTG GAA-3' (FRAG 124) (SEQ ID NO:9503)
5'-GC GGC CTG GA-3' (FRAG 125) (SEQ ID NO:9504)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 126) (SEQ ID NO:9505)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 127) (SEQ ID NO:9506)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 128) (SEQ ID NO:9507)
55 5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AGG CTG -3' (FRAG 129) (SEQ ID NO:9508)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 130) (SEQ ID NO:9509)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AGG C-3' (FRAG 131) (SEQ ID NO:9510)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AGG -3' (FRAG 132) (SEQ ID NO:9511)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AG-3' (FRAG 133) (SEQ ID NO:9512)
60 5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC A-3' (FRAG 134) (SEQ ID NO:9513)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC-3' (FRAG 135) (SEQ ID NO:9514)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CA-3' (FRAG 136) (SEQ ID NO:9515)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG C-3' (FRAG 137) (SEQ ID NO:9516)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG -3' (FRAG 138) (SEQ ID NO:9517)
65 5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GG-3' (FRAG 139) (SEQ ID NO:9518)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC G-3' (FRAG 140) (SEQ ID NO:9519)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC -3' (FRAG 141) (SEQ ID NO:9520)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TG -3' (FRAG 142) (SEQ ID NO:9521)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT T G-3' (FRAG 143) (SEQ ID NO:9522)
70 5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 144) (SEQ ID NO:9523)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 145) (SEQ ID NO:9524)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG C-3' (FRAG 146) (SEQ ID NO:9525)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CGG -3' (FRAG 147) (SEQ ID NO:9526)
5'-C GGC CTG GAA AGC TGA GAT GGA GGG CG -3' (FRAG 148) (SEQ ID NO:9527)
75 5'-C GGC CTG GAA AGC TGA GAT GGA GGG C -3' (FRAG 148) (SEQ ID NO:9528)

- 5'-C GGC CTG GAA AGC TGA GAT GGA GGG -3' (FRAG 150) (SEQ ID NO:9529)
 5'-C GGC CTG GAA AGC TGA GAT GGA GG -3' (FRAG 151) (SEQ ID NO:9530)
 5'-C GGC CTG GAA AGC TGA GAT GGA G -3' (FRAG 152) (SEQ ID NO:9531)
 5'-C GGC CTG GAA AGC TGA GAT GGA -3' (FRAG 153) (SEQ ID NO:9532)
 5'-C GGC CTG GAA AGC TGA GAT GG -3' (FRAG 154) (SEQ ID NO:9533)
 5'-C GGC CTG GAA AGC TGA GAT G -3' (FRAG 155) (SEQ ID NO:9534)
 5'-C GGC CTG GAA AGC TGA GAT -3' (FRAG 156) (SEQ ID NO:9535)
 5'-C GGC CTG GAA AGC TGA GA-3' (FRAG 157) (SEQ ID NO:9536)
 5'-C GGC CTG GAA AGC TGA G-3' (FRAG 158) (SEQ ID NO:9537)
 5'-C GGC CTG GAA AGC TGA-3' (FRAG 159) (SEQ ID NO:9538)
 5'-C GGC CTG GAA AGC TG-3' (FRAG 160) (SEQ ID NO:9539)
 5'-C GGC CTG GAA AGC T-3' (FRAG 161) (SEQ ID NO:9540)
 5'-C GGC CTG GAA AGC-3' (FRAG 162) (SEQ ID NO:9541)
 5'-C GGC CTG GAA AG-3' (FRAG 163) (SEQ ID NO:9542)
 5'-C GGC CTG GAA A-3' (FRAG 164) (SEQ ID NO:9543)
 5'-C GGC CTG GAA -3' (FRAG 165) (SEQ ID NO:9544)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 166) (SEQ ID NO:9545)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 167) (SEQ ID NO:9546)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 168) (SEQ ID NO:9547)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 169) (SEQ ID NO:9548)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 170) (SEQ ID NO:9549)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AGG C-3' (FRAG 171) (SEQ ID NO:9550)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 172) (SEQ ID NO:9551)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 173) (SEQ ID NO:9552)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 174) (SEQ ID NO:9553)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 175) (SEQ ID NO:9554)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CA-3' (FRAG 176) (SEQ ID NO:9555)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG C-3' (FRAG 177) (SEQ ID NO:9556)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG -3' (FRAG 178) (SEQ ID NO:9557)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GG-3' (FRAG 179) (SEQ ID NO:9558)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC G-3' (FRAG 180) (SEQ ID NO:9559)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC -3' (FRAG 181) (SEQ ID NO:9560)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT TG-3' (FRAG 182) (SEQ ID NO:9561)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT G-3' (FRAG 183) (SEQ ID NO:9562)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 184) (SEQ ID NO:9563)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 185) (SEQ ID NO:9564)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG C-3' (FRAG 186) (SEQ ID NO:9565)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CGG -3' (FRAG 187) (SEQ ID NO:9566)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG CG -3' (FRAG 188) (SEQ ID NO:9567)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG C-3' (FRAG 189) (SEQ ID NO:9568)
 5'-GGC CTG GAA AGC TGA GAT GGA GGG -3' (FRAG 190) (SEQ ID NO:9569)
 5'-GGC CTG GAA AGC TGA GAT GGA GG -3' (FRAG 191) (SEQ ID NO:9570)
 5'-GGC CTG GAA AGC TGA GAT GGA G -3' (FRAG 192) (SEQ ID NO:9571)
 5'-GGC CTG GAA AGC TGA GAT GGA -3' (FRAG 193) (SEQ ID NO:9572)
 5'-GGC CTG GAA AGC TGA GAT GG -3' (FRAG 194) (SEQ ID NO:9573)
 5'-GGC CTG GAA AGC TGA GAT G -3' (FRAG 195) (SEQ ID NO:9574)
 5'-GGC CTG GAA AGC TGA GAT -3' (FRAG 196) (SEQ ID NO:9575)
 5'-GGC CTG GAA AGC TGA GA-3' (FRAG 197) (SEQ ID NO:9576)
 5'-GGC CTG GAA AGC TGA G-3' (FRAG 198) (SEQ ID NO:9577)
 5'-GGC CTG GAA AGC TGA-3' (FRAG 199) (SEQ ID NO:9578)
 5'-GGC CTG GAA AGC TG-3' (FRAG 200) (SEQ ID NO:9579)
 5'-GGC CTG GAA AGC T-3' (FRAG 201) (SEQ ID NO:9580)
 5'-GGC CTG GAA AGC-3' (FRAG 202) (SEQ ID NO:9581)
 5'-GGC CTG GAA AG-3' (FRAG 203) (SEQ ID NO:9582)
 5'-GGC CTG GAA A-3' (FRAG 204) (SEQ ID NO:9583)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 205) (SEQ ID NO:9584)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 206) (SEQ ID NO:9585)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AGG CTG G-3' (FRAG 207) (SEQ ID NO:9586)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AGG CTG -3' (FRAG 208) (SEQ ID NO:9587)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AGG CT-3' (FRAG 209) (SEQ ID NO:9588)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AGG C-3' (FRAG 210) (SEQ ID NO:9589)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AGG -3' (FRAG 211) (SEQ ID NO:9590)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC AG-3' (FRAG 212) (SEQ ID NO:9591)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC A-3' (FRAG 213) (SEQ ID NO:9592)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CAC-3' (FRAG 214) (SEQ ID NO:9593)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG CA-3' (FRAG 215) (SEQ ID NO:9594)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG C-3' (FRAG 216) (SEQ ID NO:9595)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GGG -3' (FRAG 217) (SEQ ID NO:9596)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC GG-3' (FRAG 218) (SEQ ID NO:9597)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC G-3' (FRAG 219) (SEQ ID NO:9598)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TGC -3' (FRAG 220) (SEQ ID NO:9599)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT TG-3' (FRAG 221) (SEQ ID NO:9600)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT G-3' (FRAG 222) (SEQ ID NO:9601)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 223) (SEQ ID NO:9602)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 224) (SEQ ID NO:9603)

- 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG C-3' (FRAG 225) (SEQ ID NO:9604)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CGG -3' (FRAG 226) (SEQ ID NO:9605)
 5'-GC CTG GAA AGC TGA GAT GGA GGG CG -3' (FRAG 227) (SEQ ID NO:9606)
 5'-GC CTG GAA AGC TGA GAT GGA GGG C -3' (FRAG 228) (SEQ ID NO:9607)
 5'-GC CTG GAA AGC TGA GAT GGA GGG -3' (FRAG 229) (SEQ ID NO:9608)
 5'-GC CTG GAA AGC TGA GAT GGA GG -3' (FRAG 230) (SEQ ID NO:9609)
 5'-GC CTG GAA AGC TGA GAT GGA G -3' (FRAG 231) (SEQ ID NO:9610)
 5'-GC CTG GAA AGC TGA GAT GGA -3' (FRAG 232) (SEQ ID NO:9611)
 5'-GC CTG GAA AGC TGA GAT GG -3' (FRAG 233) (SEQ ID NO:9612)
 5'-GC CTG GAA AGC TGA GAT G -3' (FRAG 234) (SEQ ID NO:9613)
 5'-GC CTG GAA AGC TGA GAT -3' (FRAG 235) (SEQ ID NO:9614)
 5'-GC CTG GAA AGC TGA GA-3' (FRAG 236) (SEQ ID NO:9615)
 5'-GC CTG GAA AGC TGA G-3' (FRAG 237) (SEQ ID NO:9616)
 5'-GC CTG GAA AGC TGA-3' (FRAG 238) (SEQ ID NO:9617)
 5'-GC CTG GAA AGC TG-3' (FRAG 239) (SEQ ID NO:9618)
 5'-GC CTG GAA AGC T-3' (FRAG 240) (SEQ ID NO:9619)
 5'-GC CTG GAA AGC-3' (FRAG 241) (SEQ ID NO:9620)
 5'-GC CTG GAA AG-3' (FRAG 242) (SEQ ID NO:9621)
 5'-C CTG GAA AGC TGA GAT GG A GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 243) (SEQ ID NO:9622)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 244) (SEQ ID NO:9623)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 245) (SEQ ID NO:9624)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 246) (SEQ ID NO:9625)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 247) (SEQ ID NO:9626)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 248) (SEQ ID NO:9627)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 249) (SEQ ID NO:9628)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 250) (SEQ ID NO:9629)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 251) (SEQ ID NO:9630)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 252) (SEQ ID NO:9631)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 253) (SEQ ID NO:9632)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 254) (SEQ ID NO:9633)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 255) (SEQ ID NO:9634)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 256) (SEQ ID NO:9635)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 257) (SEQ ID NO:9636)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 258) (SEQ ID NO:9637)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 259) (SEQ ID NO:9638)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT G -3' (FRAG 260) (SEQ ID NO:9639)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 261) (SEQ ID NO:9640)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 262) (SEQ ID NO:9641)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG C-3' (FRAG 263) (SEQ ID NO:9642)
 5'-C CTG GAA AGC TGA GAT GGA GGG CGG -3' (FRAG 264) (SEQ ID NO:9643)
 5'-C CTG GAA AGC TGA GAT GGA GGG CG -3' (FRAG 265) (SEQ ID NO:9644)
 5'-C CTG GAA AGC TGA GAT GGA GGG C -3' (FRAG 266) (SEQ ID NO:9645)
 5'-C CTG GAA AGC TGA GAT GGA GGG -3' (FRAG 267) (SEQ ID NO:9646)
 5'-C CTG GAA AGC TGA GAT GGA GG -3' (FRAG 268) (SEQ ID NO:9647)
 5'-C CTG GAA AGC TGA GAT GGA G -3' (FRAG 269) (SEQ ID NO:9648)
 5'-C CTG GAA AGC TGA GAT GGA -3' (FRAG 270) (SEQ ID NO:9649)
 5'-C CTG GAA AGC TGA GAT GG -3' (FRAG 271) (SEQ ID NO:9650)
 5'-C CTG GAA AGC TGA GAT G -3' (FRAG 272) (SEQ ID NO:9651)
 5'-C CTG GAA AGC TGA GAT -3' (FRAG 273) (SEQ ID NO:9652)
 5'-C CTG GAA AGC TGA GA-3' (FRAG 274) (SEQ ID NO:9653)
 5'-C CTG GAA AGC TGA G-3' (FRAG 275) (SEQ ID NO:9654)
 5'-C CTG GAA AGC TGA-3' (FRAG 276) (SEQ ID NO:9655)
 5'-C CTG GAA AGC TG-3' (FRAG 277) (SEQ ID NO:9656)
 5'-C CTG GAA AGC T-3' (FRAG 278) (SEQ ID NO:9657)
 5'-C CTG GAA AGC-3' (FRAG 279) (SEQ ID NO:9658)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 280) (SEQ ID NO:9659)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 281) (SEQ ID NO:9660)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 282) (SEQ ID NO:9661)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 283) (SEQ ID NO:9662)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 284) (SEQ ID NO:9663)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 285) (SEQ ID NO:9664)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 286) (SEQ ID NO:9665)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 287) (SEQ ID NO:9666)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 288) (SEQ ID NO:9667)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 289) (SEQ ID NO:9668)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 290) (SEQ ID NO:9669)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 291) (SEQ ID NO:9670)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 292) (SEQ ID NO:9671)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 293) (SEQ ID NO:9672)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 294) (SEQ ID NO:9673)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 295) (SEQ ID NO:9674)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 296) (SEQ ID NO:9675)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT G -3' (FRAG 297) (SEQ ID NO:9676)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 298) (SEQ ID NO:9677)
 5'-CTG GAA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 299) (SEQ ID NO:9678)

- 5'- CTG GAA AGC TGA GAT GGA GGG CGG C-3' (FRAG 300) (SEQ ID NO:9679)
5'- CTG GAA AGC TGA GAT GGA GGG CGG -3' (FRAG 301) (SEQ ID NO:9680)
5'- CTG GAA AGC TGA GAT GGA GGG CG -3' (FRAG 302) (SEQ ID NO:9681)
5'- CTG GAA AGC TGA GAT GGA GGG C -3' (FRAG 303) (SEQ ID NO:9682)
5'- CTG GAA AGC TGA GAT GGA GGG -3' (FRAG 304) (SEQ ID NO:9683)
5'- CTG GAA AGC TGA GAT GGA GG -3' (FRAG 305) (SEQ ID NO:9684)
5'- CTG GAA AGC TGA GAT GGA G -3' (FRAG 306) (SEQ ID NO:9685)
5'- CTG GAA AGC TGA GAT GGA -3' (FRAG 307) (SEQ ID NO:9686)
5'- CTG GAA AGC TGA GAT GG -3' (FRAG 308) (SEQ ID NO:9687)
5'- CTG GAA AGC TGA GAT G -3' (FRAG 309) (SEQ ID NO:9688)
5'- CTG GAA AGC TGA GAT -3' (FRAG 310) (SEQ ID NO:9689)
5'- CTG GAA AGC TGA GA-3' (FRAG 311) (SEQ ID NO:9690)
5'- CTG GAA AGC TGA G-3' (FRAG 312) (SEQ ID NO:9691)
5'- CTG GAA AGC TGA-3' (FRAG 313) (SEQ ID NO:9692)
5'- CTG GAA AGC TG-3' (FRAG 314) (SEQ ID NO:9693)
5'- CTG GAA AGC T-3' (FRAG 315) (SEQ ID NO:9694)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 316) (SEQ ID NO:9695)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 317) (SEQ ID NO:9696)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 318) (SEQ ID NO:9697)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 319) (SEQ ID NO:9698)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 320) (SEQ ID NO:9699)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 321) (SEQ ID NO:9700)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 322) (SEQ ID NO:9701)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 323) (SEQ ID NO:9702)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 324) (SEQ ID NO:9703)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 325) (SEQ ID NO:9704)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 326) (SEQ ID NO:9705)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 327) (SEQ ID NO:9706)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 328) (SEQ ID NO:9707)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 329) (SEQ ID NO:9708)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 330) (SEQ ID NO:9709)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 331) (SEQ ID NO:9710)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 332) (SEQ ID NO:9711)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT G -3' (FRAG 333) (SEQ ID NO:9712)
5'- TG GAA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 334) (SEQ ID NO:9713)
5'- TG GAA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 335) (SEQ ID NO:9714)
5'- TG GAA AGC TGA GAT GGA GGG CGG C-3' (FRAG 336) (SEQ ID NO:9715)
5'- TG GAA AGC TGA GAT GGA GGG CGG -3' (FRAG 337) (SEQ ID NO:9716)
5'- TG GAA AGC TGA GAT GGA GGG CG -3' (FRAG 338) (SEQ ID NO:9717)
5'- TG GAA AGC TGA GAT GGA GGG C -3' (FRAG 339) (SEQ ID NO:9718)
5'- TG GAA AGC TGA GAT GGA GGG -3' (FRAG 340) (SEQ ID NO:9719)
5'- TG GAA AGC TGA GAT GGA GG -3' (FRAG 341) (SEQ ID NO:9720)
5'- TG GAA AGC TGA GAT GGA G -3' (FRAG 342) (SEQ ID NO:9721)
5'- TG GAA AGC TGA GAT GGA -3' (FRAG 343) (SEQ ID NO:9722)
5'- TG GAA AGC TGA GAT GG -3' (FRAG 344) (SEQ ID NO:9723)
5'- TG GAA AGC TGA GAT G -3' (FRAG 345) (SEQ ID NO:9724)
5'- TG GAA AGC TGA GAT -3' (FRAG 346) (SEQ ID NO:9725)
5'- TG GAA AGC TGA GA-3' (FRAG 347) (SEQ ID NO:9726)
5'- TG GAA AGC TGA G-3' (FRAG 348) (SEQ ID NO:9727)
5'- TG GAA AGC TGA-3' (FRAG 349) (SEQ ID NO:9728)
5'- TG GAA AGC TG-3' (FRAG 350) (SEQ ID NO:9729)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 351) (SEQ ID NO:9730)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 352) (SEQ ID NO:9731)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 353) (SEQ ID NO:9732)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 354) (SEQ ID NO:9733)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 355) (SEQ ID NO:9734)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 356) (SEQ ID NO:9735)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 357) (SEQ ID NO:9736)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 358) (SEQ ID NO:9737)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 359) (SEQ ID NO:9738)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 360) (SEQ ID NO:9739)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 361) (SEQ ID NO:9740)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 362) (SEQ ID NO:9741)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 363) (SEQ ID NO:9742)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 364) (SEQ ID NO:9743)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 365) (SEQ ID NO:9744)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 366) (SEQ ID NO:9745)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 367) (SEQ ID NO:9746)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT G -3' (FRAG 368) (SEQ ID NO:9747)
5'- G GAA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 369) (SEQ ID NO:9748)
5'- G GAA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 370) (SEQ ID NO:9749)
5'- G GAA AGC TGA GAT GGA GGG CGG C-3' (FRAG 371) (SEQ ID NO:9750)
5'- G GAA AGC TGA GAT GGA GGG CGG -3' (FRAG 372) (SEQ ID NO:9751)
5'- G GAA AGC TGA GAT GGA GGG CG -3' (FRAG 373) (SEQ ID NO:9752)
5'- G GAA AGC TGA GAT GGA GGG C -3' (FRAG 374) (SEQ ID NO:9753)

- 5'- G GAA AGC TGA GAT GGA GGG -3' (FRAG 375) (SEQ ID NO:9754)
 5'- G GAA AGC TGA GAT GGA GG -3' (FRAG 376) (SEQ ID NO:9755)
 5'- G GAA AGC TGA GAT GGA G -3' (FRAG 377) (SEQ ID NO:9756)
 5'- G GAA AGC TGA GAT GGA -3' (FRAG 378) (SEQ ID NO:9757)
 5 G 5'- G GAA AGC TGA GAT GG -3' (FRAG 379) (SEQ ID NO:9758)
 5'- G GAA AGC TGA GAT G -3' (FRAG 380) (SEQ ID NO:9759)
 5'- G GAA AGC TGA GAT -3' (FRAG 381) (SEQ ID NO:9760)
 5'- G GAA AGC TGA GA-3' (FRAG 382) (SEQ ID NO:9761)
 5'- G GAA AGC TGA G-3' (FRAG 383) (SEQ ID NO:9762)
 10 5'- G GAA AGC TGA-3' (FRAG 384) (SEQ ID NO:9763)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 385) (SEQ ID NO:9764)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 386) (SEQ ID NO:9765)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 387) (SEQ ID NO:9766)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 388) (SEQ ID NO:9767)
 15 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 389) (SEQ ID NO:9768)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 390) (SEQ ID NO:9769)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 391) (SEQ ID NO:9770)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 392) (SEQ ID NO:9771)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 393) (SEQ ID NO:9772)
 20 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 394) (SEQ ID NO:9773)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 395) (SEQ ID NO:9774)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 396) (SEQ ID NO:9775)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 397) (SEQ ID NO:9776)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 398) (SEQ ID NO:9777)
 25 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 399) (SEQ ID NO:9778)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 400) (SEQ ID NO:9779)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 401) (SEQ ID NO:9780)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT G -3' (FRAG 402) (SEQ ID NO:9781)
 5'- GAA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 403) (SEQ ID NO:9782)
 30 5'- GAA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 404) (SEQ ID NO:9783)
 5'- GAA AGC TGA GAT GGA GGG CGG C-3' (FRAG 405) (SEQ ID NO:9784)
 5'- GAA AGC TGA GAT GGA GGG CGG -3' (FRAG 406) (SEQ ID NO:9785)
 5'- GAA AGC TGA GAT GGA GGG CG -3' (FRAG 407) (SEQ ID NO:9786)
 5'- GAA AGC TGA GAT GGA GGG C -3' (FRAG 408) (SEQ ID NO:9787)
 35 5'- GAA AGC TGA GAT GGA GGG -3' (FRAG 409) (SEQ ID NO:9788)
 5'- GAA AGC TGA GAT GGA GG -3' (FRAG 410) (SEQ ID NO:9789)
 5'- GAA AGC TGA GAT GGA G -3' (FRAG 411) (SEQ ID NO:9790)
 5'- GAA AGC TGA GAT GGA -3' (FRAG 412) (SEQ ID NO:9791)
 40 5'- GAA AGC TGA GAT GG -3' (FRAG 413) (SEQ ID NO:9792)
 5'- GAA AGC TGA GAT G -3' (FRAG 414) (SEQ ID NO:9793)
 5'- GAA AGC TGA GAT -3' (FRAG 415) (SEQ ID NO:9794)
 5'- GAA AGC TGA GA-3' (FRAG 416) (SEQ ID NO:9795)
 5'- GAA AGC TGA G-3' (FRAG 417) (SEQ ID NO:9796)
 45 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 418) (SEQ ID NO:9797)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 419) (SEQ ID NO:9798)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 420) (SEQ ID NO:9799)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 421) (SEQ ID NO:9800)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 422) (SEQ ID NO:9801)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 423) (SEQ ID NO:9802)
 50 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 424) (SEQ ID NO:9803)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 425) (SEQ ID NO:9804)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 426) (SEQ ID NO:9805)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 427) (SEQ ID NO:9806)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 428) (SEQ ID NO:9807)
 55 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 429) (SEQ ID NO:9808)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 430) (SEQ ID NO:9809)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 431) (SEQ ID NO:9810)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 432) (SEQ ID NO:9811)
 5'- AA AGC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 433) (SEQ ID NO:9812)
 60 5'- AA AGC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 434) (SEQ ID NO:9813)
 5'- AA AGC TGA GAT GGA GGG CGG CAT G -3' (FRAG 435) (SEQ ID NO:9814)
 5'- AA AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 436) (SEQ ID NO:9815)
 5'- AA AGC TGA GAT GGA GGG CGG CA-3' (FRAG 437) (SEQ ID NO:9816)
 5'- AA AGC TGA GAT GGA GGG CGG C-3' (FRAG 438) (SEQ ID NO:9817)
 65 5'- AA AGC TGA GAT GGA GGG CGG -3' (FRAG 439) (SEQ ID NO:9818)
 5'- AA AGC TGA GAT GGA GGG CG -3' (FRAG 440) (SEQ ID NO:9819)
 5'- AA AGC TGA GAT GGA GGG C -3' (FRAG 441) (SEQ ID NO:9820)
 5'- AA AGC TGA GAT GGA GGG -3' (FRAG 442) (SEQ ID NO:9821)
 5'- AA AGC TGA GAT GGA GG -3' (FRAG 443) (SEQ ID NO:9822)
 70 5'- AA AGC TGA GAT GGA G -3' (FRAG 444) (SEQ ID NO:9823)
 5'- AA AGC TGA GAT GGA -3' (FRAG 445) (SEQ ID NO:9824)
 5'- AA AGC TGA GAT GG -3' (FRAG 446) (SEQ ID NO:9825)
 5'- AA AGC TGA GAT G -3' (FRAG 447) (SEQ ID NO:9826)
 5'- AA AGC TGA GAT -3' (FRAG 448) (SEQ ID NO:9827)
 75 5'- AA AGC TGA GA-3' (FRAG 449) (SEQ ID NO:9828)

- 5'- A AGC TGA GAT GGA GGG CG G CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 450) (SEQ ID NO:9829)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 451) (SEQ ID NO:9830)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 452) (SEQ ID NO:9831)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 453) (SEQ ID NO:9832)
 5 A AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 454) (SEQ ID NO:9833)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 455) (SEQ ID NO:9834)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 456) (SEQ ID NO:9835)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 457) (SEQ ID NO:9836)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 458) (SEQ ID NO:9837)
 10 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 459) (SEQ ID NO:9838)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 460) (SEQ ID NO:9839)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 461) (SEQ ID NO:9840)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 462) (SEQ ID NO:9841)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 463) (SEQ ID NO:9842)
 15 5'- A AGC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 464) (SEQ ID NO:9843)
 5'- A AGC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 465) (SEQ ID NO:9844)
 5'- A AGC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 466) (SEQ ID NO:9845)
 5'- A AGC TGA GAT GGA GGG CGG CAT G -3' (FRAG 467) (SEQ ID NO:9846)
 5'- A AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 468) (SEQ ID NO:9847)
 20 5'- A AGC TGA GAT GGA GGG CGG CA-3' (FRAG 469) (SEQ ID NO:9848)
 5'- A AGC TGA GAT GGA GGG CGG C-3' (FRAG 470) (SEQ ID NO:9849)
 5'- A AGC TGA GAT GGA GGG CGG -3' (FRAG 471) (SEQ ID NO:9850)
 5'- A AGC TGA GAT GGA GGG CG -3' (FRAG 472) (SEQ ID NO:9851)
 5'- A AGC TGA GAT GGA GGG C -3' (FRAG 473) (SEQ ID NO:9852)
 25 5'- A AGC TGA GAT GGA GGG -3' (FRAG 474) (SEQ ID NO:9853)
 5'- A AGC TGA GAT GGA GG -3' (FRAG 475) (SEQ ID NO:9854)
 5'- A AGC TGA GAT GGA G -3' (FRAG 476) (SEQ ID NO:9855)
 5'- A AGC TGA GAT GGA -3' (FRAG 477) (SEQ ID NO:9856)
 5'- A AGC TGA GAT GG -3' (FRAG 478) (SEQ ID NO:9857)
 30 5'- A AGC TGA GAT G -3' (FRAG 479) (SEQ ID NO:9858)
 5'- A AGC TGA GAT -3' (FRAG 480) (SEQ ID NO:9859)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 481) (SEQ ID NO:9860)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 482) (SEQ ID NO:9861)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 483) (SEQ ID NO:9862)
 35 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 484) (SEQ ID NO:9863)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 485) (SEQ ID NO:9864)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 486) (SEQ ID NO:9865)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 487) (SEQ ID NO:9866)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 488) (SEQ ID NO:9867)
 40 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 489) (SEQ ID NO:9868)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 490) (SEQ ID NO:9869)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 491) (SEQ ID NO:9870)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 492) (SEQ ID NO:9871)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 493) (SEQ ID NO:9872)
 45 5'- AGC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 494) (SEQ ID NO:9873)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 495) (SEQ ID NO:9874)
 5'- AGC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 496) (SEQ ID NO:9875)
 5'- AGC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 497) (SEQ ID NO:9876)
 5'- AGC TGA GAT GGA GGG CGG CAT G -3' (FRAG 498) (SEQ ID NO:9877)
 50 5'- AGC TGA GAT GGA GGG CGG CAT -3' (FRAG 499) (SEQ ID NO:9878)
 5'- AGC TGA GAT GGA GGG CGG CA-3' (FRAG 500) (SEQ ID NO:9879)
 5'- AGC TGA GAT GGA GGG CGG C-3' (FRAG 501) (SEQ ID NO:9880)
 5'- AGC TGA GAT GGA GGG CGG -3' (FRAG 502) (SEQ ID NO:9881)
 5'- AGC TGA GAT GGA GGG CG -3' (FRAG 503) (SEQ ID NO:9882)
 55 5'- AGC TGA GAT GGA GGG C -3' (FRAG 504) (SEQ ID NO:9883)
 5'- AGC TGA GAT GGA GGG -3' (FRAG 505) (SEQ ID NO:9884)
 5'- AGC TGA GAT GGA GG -3' (FRAG 506) (SEQ ID NO:9885)
 5'- AGC TGA GAT GGA G -3' (FRAG 507) (SEQ ID NO:9886)
 5'- AGC TGA GAT GGA -3' (FRAG 508) (SEQ ID NO:9887)
 60 5'- AGC TGA GAT GG -3' (FRAG 509) (SEQ ID NO:9888)
 5'- AGC TGA GAT G -3' (FRAG 510) (SEQ ID NO:9889)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 511) (SEQ ID NO:9890)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 512) (SEQ ID NO:9891)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 513) (SEQ ID NO:9892)
 65 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 514) (SEQ ID NO:9893)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 515) (SEQ ID NO:9894)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 516) (SEQ ID NO:9895)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 517) (SEQ ID NO:9896)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 518) (SEQ ID NO:9897)
 70 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 519) (SEQ ID NO:9898)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 520) (SEQ ID NO:9899)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 521) (SEQ ID NO:9900)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 522) (SEQ ID NO:9901)
 5'- GC TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 523) (SEQ ID NO:9902)
 75 5'- GC TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 524) (SEQ ID NO:9903)

- 5'- GC TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 525) (SEQ ID NO:9904)
 5'- GC TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 526) (SEQ ID NO:9905)
 5'- GC TGA GAT GGA GGG CGG CAT GG -3' (FRAG 527) (SEQ ID NO:9906)
 5'- GC TGA GAT GGA GGG CGG CAT G -3' (FRAG 528) (SEQ ID NO:9907)
 5 5'- GC TGA GAT GGA GGG CGG CAT -3' (FRAG 529) (SEQ ID NO:9908)
 5'- GC TGA GAT GGA GGG CGG CA-3' (FRAG 530) (SEQ ID NO:9909)
 5'- GC TGA GAT GGA GGG CGG C-3' (FRAG 531) (SEQ ID NO:9910)
 5'- GC TGA GAT GGA GGG CGG -3' (FRAG 532) (SEQ ID NO:9911)
 5'- GC TGA GAT GGA GGG CG -3' (FRAG 533) (SEQ ID NO:9912)
 10 5'- GC TGA GAT GGA GGG C -3' (FRAG 534) (SEQ ID NO:9913)
 5'- GC TGA GAT GGA GGG -3' (FRAG 535) (SEQ ID NO:9914)
 5'- GC TGA GAT GGA GG -3' (FRAG 536) (SEQ ID NO:9915)
 5'- GC TGA GAT GGA G -3' (FRAG 537) (SEQ ID NO:9916)
 5'- GC TGA GAT GGA -3' (FRAG 538) (SEQ ID NO:9917)
 15 5'- GC TGA GAT GG -3' (FRAG 539) (SEQ ID NO:9918)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 540) (SEQ ID NO:9919)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 541) (SEQ ID NO:9920)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 542) (SEQ ID NO:9921)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 543) (SEQ ID NO:9922)
 20 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 544) (SEQ ID NO:9923)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 545) (SEQ ID NO:9924)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 546) (SEQ ID NO:9925)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 547) (SEQ ID NO:9926)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 548) (SEQ ID NO:9927)
 25 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 549) (SEQ ID NO:9928)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 550) (SEQ ID NO:9929)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 551) (SEQ ID NO:9930)
 5'- C TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 552) (SEQ ID NO:9931)
 5'- C TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 553) (SEQ ID NO:9932)
 30 5'- C TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 554) (SEQ ID NO:9933)
 5'- C TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 555) (SEQ ID NO:9934)
 5'- C TGA GAT GGA GGG CGG CAT GG -3' (FRAG 556) (SEQ ID NO:9935)
 5'- C TGA GAT GGA GGG CGG CAT G -3' (FRAG 557) (SEQ ID NO:9936)
 5'- C TGA GAT GGA GGG CGG CAT -3' (FRAG 558) (SEQ ID NO:9937)
 35 5'- C TGA GAT GGA GGG CGG CA-3' (FRAG 559) (SEQ ID NO:9938)
 5'- C TGA GAT GGA GGG CGG C-3' (FRAG 560) (SEQ ID NO:9939)
 5'- C TGA GAT GGA GGG CGG -3' (FRAG 561) (SEQ ID NO:9940)
 5'- C TGA GAT GGA GGG CG -3' (FRAG 562) (SEQ ID NO:9941)
 5'- C TGA GAT GGA GGG C -3' (FRAG 563) (SEQ ID NO:9942)
 40 5'- C TGA GAT GGA GGG -3' (FRAG 564) (SEQ ID NO:9943)
 5'- C TGA GAT GGA GG -3' (FRAG 565) (SEQ ID NO:9944)
 5'- C TGA GAT GGA G -3' (FRAG 566) (SEQ ID NO:9945)
 5'- C TGA GAT GGA -3' (FRAG 567) (SEQ ID NO:9946)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 568) (SEQ ID NO:9947)
 45 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 569) (SEQ ID NO:9948)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 570) (SEQ ID NO:9949)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 571) (SEQ ID NO:9950)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 572) (SEQ ID NO:9951)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 573) (SEQ ID NO:9952)
 50 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 574) (SEQ ID NO:9953)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 575) (SEQ ID NO:9954)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 576) (SEQ ID NO:9955)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 577) (SEQ ID NO:9956)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 578) (SEQ ID NO:9957)
 55 5'- TGA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 579) (SEQ ID NO:9958)
 5'- TGA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 580) (SEQ ID NO:9959)
 5'- TGA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 581) (SEQ ID NO:9960)
 5'- TGA GAT GGA GGG CGG CAT GGC G-3' (FRAG 582) (SEQ ID NO:9961)
 5'- TGA GAT GGA GGG CGG CAT GGC -3' (FRAG 583) (SEQ ID NO:9962)
 60 5'- TGA GAT GGA GGG CGG CAT GG -3' (FRAG 584) (SEQ ID NO:9963)
 5'- TGA GAT GGA GGG CGG CAT G -3' (FRAG 585) (SEQ ID NO:9964)
 5'- TGA GAT GGA GGG CGG CAT -3' (FRAG 586) (SEQ ID NO:9965)
 5'- TGA GAT GGA GGG CGG CA-3' (FRAG 587) (SEQ ID NO:9966)
 5'- TGA GAT GGA GGG CGG C-3' (FRAG 588) (SEQ ID NO:9967)
 65 5'- TGA GAT GGA GGG CGG -3' (FRAG 589) (SEQ ID NO:9968)
 5'- TGA GAT GGA GGG CG -3' (FRAG 590) (SEQ ID NO:9969)
 5'- TGA GAT GGA GGG C -3' (FRAG 591) (SEQ ID NO:9970)
 5'- TGA GAT GGA GGG -3' (FRAG 592) (SEQ ID NO:9971)
 5'- TGA GAT GGA GG -3' (FRAG 593) (SEQ ID NO:9972)
 70 5'- TGA GAT GGA G -3' (FRAG 594) (SEQ ID NO:9973)
 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 595) (SEQ ID NO:9974)
 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 596) (SEQ ID NO:9975)
 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 597) (SEQ ID NO:9976)
 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 598) (SEQ ID NO:9977)
 75 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 599) (SEQ ID NO:9978)

- 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 600) (SEQ ID NO:9979)
 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 601) (SEQ ID NO:9980)
 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 602) (SEQ ID NO:9981)
 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 603) (SEQ ID NO:9982)
 5'- GA GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 604) (SEQ ID NO:9983)
 5'- GA GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 605) (SEQ ID NO:9984)
 5'- GA GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 606) (SEQ ID NO:9985)
 5'- GA GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 607) (SEQ ID NO:9986)
 5'- GA GAT GGA GGG CGG CAT GGC GG-3' (FRAG 608) (SEQ ID NO:9987)
 5'- GA GAT GGA GGG CGG CAT GGC G-3' (FRAG 609) (SEQ ID NO:9988)
 5'- GA GAT GGA GGG CGG CAT GGC -3' (FRAG 610) (SEQ ID NO:9989)
 5'- GA GAT GGA GGG CGG CAT GG -3' (FRAG 611) (SEQ ID NO:9990)
 5'- GA GAT GGA GGG CGG CAT G -3' (FRAG 612) (SEQ ID NO:9991)
 5'- GA GAT GGA GGG CGG CAT -3' (FRAG 613) (SEQ ID NO:9992)
 5'- GA GAT GGA GGG CGG CA-3' (FRAG 614) (SEQ ID NO:9993)
 5'- GA GAT GGA GGG CGG C-3' (FRAG 615) (SEQ ID NO:9994)
 5'- GA GAT GGA GGG CGG -3' (FRAG 616) (SEQ ID NO:9995)
 5'- GA GAT GGA GGG CG -3' (FRAG 617) (SEQ ID NO:9996)
 5'- GA GAT GGA GGG C -3' (FRAG 618) (SEQ ID NO:9997)
 5'- GA GAT GGA GGG -3' (FRAG 619) (SEQ ID NO:9998)
 5'- GA GAT GGA GG -3' (FRAG 620) (SEQ ID NO:9999)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 621) (SEQ ID NO:10000)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 622) (SEQ ID NO:10001)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 623) (SEQ ID NO:10002)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 624) (SEQ ID NO:10003)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 625) (SEQ ID NO:10004)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 626) (SEQ ID NO:10005)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 627) (SEQ ID NO:10006)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 628) (SEQ ID NO:10007)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 629) (SEQ ID NO:10008)
 5'- A GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 630) (SEQ ID NO:10009)
 5'- A GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 631) (SEQ ID NO:10010)
 5'- A GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 632) (SEQ ID NO:10011)
 5'- A GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 633) (SEQ ID NO:10012)
 5'- A GAT GGA GGG CGG CAT GGC GG-3' (FRAG 634) (SEQ ID NO:10013)
 5'- A GAT GGA GGG CGG CAT GGC G-3' (FRAG 635) (SEQ ID NO:10014)
 5'- A GAT GGA GGG CGG CAT GGC -3' (FRAG 636) (SEQ ID NO:10015)
 5'- A GAT GGA GGG CGG CAT GG -3' (FRAG 637) (SEQ ID NO:10016)
 5'- A GAT GGA GGG CGG CAT G -3' (FRAG 638) (SEQ ID NO:10017)
 5'- A GAT GGA GGG CGG CAT -3' (FRAG 639) (SEQ ID NO:10018)
 5'- A GAT GGA GGG CGG CA-3' (FRAG 640) (SEQ ID NO:10019)
 5'- A GAT GGA GGG CGG C-3' (FRAG 641) (SEQ ID NO:10020)
 5'- A GAT GGA GGG CGG -3' (FRAG 642) (SEQ ID NO:10021)
 5'- A GAT GGA GGG CG -3' (FRAG 643) (SEQ ID NO:10022)
 5'- A GAT GGA GGG C -3' (FRAG 644) (SEQ ID NO:10023)
 5'- A GAT GGA GGG -3' (FRAG 645) (SEQ ID NO:10024)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 646) (SEQ ID NO:10025)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 647) (SEQ ID NO:10026)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 648) (SEQ ID NO:10027)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 649) (SEQ ID NO:10028)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 650) (SEQ ID NO:10029)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 651) (SEQ ID NO:10030)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 652) (SEQ ID NO:10031)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 653) (SEQ ID NO:10032)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 654) (SEQ ID NO:10033)
 5'- GAT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 655) (SEQ ID NO:10034)
 5'- GAT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 656) (SEQ ID NO:10035)
 5'- GAT GGA GGG CGG CAT GGC GGG C-3' (FRAG 657) (SEQ ID NO:10036)
 5'- GAT GGA GGG CGG CAT GGC GGG -3' (FRAG 658) (SEQ ID NO:10037)
 5'- GAT GGA GGG CGG CAT GGC GG-3' (FRAG 659) (SEQ ID NO:10038)
 5'- GAT GGA GGG CGG CAT GGC G-3' (FRAG 660) (SEQ ID NO:10039)
 5'- GAT GGA GGG CGG CAT GGC -3' (FRAG 661) (SEQ ID NO:10040)
 5'- GAT GGA GGG CGG CAT GG -3' (FRAG 662) (SEQ ID NO:10041)
 5'- GAT GGA GGG CGG CAT G -3' (FRAG 663) (SEQ ID NO:10042)
 5'- GAT GGA GGG CGG CAT -3' (FRAG 664) (SEQ ID NO:10043)
 5'- GAT GGA GGG CGG CA-3' (FRAG 665) (SEQ ID NO:10044)
 5'- GAT GGA GGG CGG C-3' (FRAG 666) (SEQ ID NO:10045)
 5'- GAT GGA GGG CGG -3' (FRAG 667) (SEQ ID NO:10046)
 5'- GAT GGA GGG CG -3' (FRAG 668) (SEQ ID NO:10047)
 5'- GAT GGA GGG C -3' (FRAG 669) (SEQ ID NO:10048)
 5'- AT GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 670) (SEQ ID NO:10049)
 5'- AT GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 671) (SEQ ID NO:10050)
 5'- AT GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 672) (SEQ ID NO:10051)
 5'- AT GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 673) (SEQ ID NO:10052)
 5'- AT GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 674) (SEQ ID NO:10053)

- 5'- AT GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 675) (SEQ ID NO:10054)
5'- AT GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 676) (SEQ ID NO:10055)
5'- AT GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 677) (SEQ ID NO:10056)
5'- AT GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 678) (SEQ ID NO:10057)
5- AT GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 679) (SEQ ID NO:10058)
5'- AT GGA GGG CGG CAT GGC GGG CA-3' (FRAG 680) (SEQ ID NO:10059)
5'- AT GGA GGG CGG CAT GGC GGG C-3' (FRAG 681) (SEQ ID NO:10060)
5'- AT GGA GGG CGG CAT GGC GGG -3' (FRAG 682) (SEQ ID NO:10061)
5'- AT GGA GGG CGG CAT GGC GG-3' (FRAG 683) (SEQ ID NO:10062)
10 5'- AT GGA GGG CGG CAT GGC G-3' (FRAG 684) (SEQ ID NO:10063)
5'- AT GGA GGG CGG CAT GGC -3' (FRAG 685) (SEQ ID NO:10064)
5'- AT GGA GGG CGG CAT GG -3' (FRAG 686) (SEQ ID NO:10065)
5'- AT GGA GGG CGG CAT G -3' (FRAG 687) (SEQ ID NO:10066)
5'- AT GGA GGG CGG CAT -3' (FRAG 688) (SEQ ID NO:10067)
15 5'- AT GGA GGG CGG CA-3' (FRAG 689) (SEQ ID NO:10068)
5'- AT GGA GGG CGG C-3' (FRAG 690) (SEQ ID NO:10069)
5'- AT GGA GGG CGG -3' (FRAG 691) (SEQ ID NO:10070)
5'- AT GGA GGG CG -3' (FRAG 692) (SEQ ID NO:10071)
5'- T GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 693) (SEQ ID NO:10072)
20 5'- T GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 694) (SEQ ID NO:10073)
5'- T GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 695) (SEQ ID NO:10074)
5'- T GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 696) (SEQ ID NO:10075)
5'- T GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 697) (SEQ ID NO:10076)
5'- T GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 698) (SEQ ID NO:10077)
25 5'- T GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 699) (SEQ ID NO:10078)
5'- T GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 700) (SEQ ID NO:10079)
5'- T GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 701) (SEQ ID NO:10080)
5'- T GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 702) (SEQ ID NO:10081)
5'- T GGA GGG CGG CAT GGC GGG CA-3' (FRAG 703) (SEQ ID NO:10082)
30 5'- T GGA GGG CGG CAT GGC GGG C-3' (FRAG 704) (SEQ ID NO:10083)
5'- T GGA GGG CGG CAT GGC GGG -3' (FRAG 705) (SEQ ID NO:10084)
5'- T GGA GGG CGG CAT GGC GG-3' (FRAG 706) (SEQ ID NO:10085)
5'- T GGA GGG CGG CAT GGC G-3' (FRAG 707) (SEQ ID NO:10086)
5'- T GGA GGG CGG CAT GGC -3' (FRAG 708) (SEQ ID NO:10087)
35 5'- T GGA GGG CGG CAT GG -3' (FRAG 709) (SEQ ID NO:10088)
5'- T GGA GGG CGG CAT G -3' (FRAG 710) (SEQ ID NO:10089)
5'- T GGA GGG CGG CAT -3' (FRAG 711) (SEQ ID NO:10090)
5'- T GGA GGG CGG CA-3' (FRAG 712) (SEQ ID NO:10091)
5'- T GGA GGG CGG C-3' (FRAG 713) (SEQ ID NO:10092)
40 5'- T GGA GGG CGG -3' (FRAG 714) (SEQ ID NO:10093)
5'- GGA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 715) (SEQ ID NO:10094)
5'- GGA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 716) (SEQ ID NO:10095)
5'- GGA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 717) (SEQ ID NO:10096)
5'- GGA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 718) (SEQ ID NO:10097)
45 5'- GGA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 719) (SEQ ID NO:10098)
5'- GGA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 720) (SEQ ID NO:10099)
5'- GGA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 721) (SEQ ID NO:10100)
5'- GGA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 722) (SEQ ID NO:10101)
5'- GGA GGG CGG CAT GGC GGG CAC A-3' (FRAG 723) (SEQ ID NO:10102)
50 5'- GGA GGG CGG CAT GGC GGG CAC-3' (FRAG 724) (SEQ ID NO:10103)
5'- GGA GGG CGG CAT GGC GGG CA-3' (FRAG 725) (SEQ ID NO:10104)
5'- GGA GGG CGG CAT GGC GGG C-3' (FRAG 726) (SEQ ID NO:10105)
5'- GGA GGG CGG CAT GGC GGG -3' (FRAG 727) (SEQ ID NO:10106)
5'- GGA GGG CGG CAT GGC GG-3' (FRAG 728) (SEQ ID NO:10107)
55 5'- GGA GGG CGG CAT GGC G-3' (FRAG 729) (SEQ ID NO:10108)
5'- GGA GGG CGG CAT GGC -3' (FRAG 730) (SEQ ID NO:10109)
5'- GGA GGG CGG CAT GG -3' (FRAG 731) (SEQ ID NO:10110)
5'- GGA GGG CGG CAT G -3' (FRAG 732) (SEQ ID NO:10111)
5'- GGA GGG CGG CAT -3' (FRAG 733) (SEQ ID NO:10112)
60 5'- GGA GGG CGG CA-3' (FRAG 734) (SEQ ID NO:10113)
5'- GGA GGG CGG C-3' (FRAG 735) (SEQ ID NO:10114)
5'- GA GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 736) (SEQ ID NO:10115)
5'- GA GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 737) (SEQ ID NO:10116)
5'- GA GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 738) (SEQ ID NO:10117)
65 5'- GA GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 739) (SEQ ID NO:10118)
5'- GA GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 740) (SEQ ID NO:10119)
5'- GA GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 741) (SEQ ID NO:10120)
5'- GA GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 742) (SEQ ID NO:10121)
5'- GA GGG CGG CAT GGC GGG CAC AG-3' (FRAG 743) (SEQ ID NO:10122)
70 5'- GA GGG CGG CAT GGC GGG CAC A-3' (FRAG 744) (SEQ ID NO:10123)
5'- GA GGG CGG CAT GGC GGG CAC-3' (FRAG 745) (SEQ ID NO:10124)
5'- GA GGG CGG CAT GGC GGG CA-3' (FRAG 746) (SEQ ID NO:10125)
5'- GA GGG CGG CAT GGC GGG C-3' (FRAG 747) (SEQ ID NO:10126)
5'- GA GGG CGG CAT GGC GGG -3' (FRAG 748) (SEQ ID NO:10127)
75 5'- GA GGG CGG CAT GGC GG-3' (FRAG 749) (SEQ ID NO:10128)

- 5'- GA GGG CGG CAT GGC G-3' (FRAG 750) (SEQ ID NO:10129)
5'- GA GGG CGG CAT GGC -3' (FRAG 751) (SEQ ID NO:10130)
5'- GA GGG CGG CAT GG -3' (FRAG 752) (SEQ ID NO:10131)
5'- GA GGG CGG CAT G -3' (FRAG 753) (SEQ ID NO:10132)
5 5'- GA GGG CGG CAT -3' (FRAG 754) (SEQ ID NO:10133)
5'- GA GGG CGG CA-3' (FRAG 755) (SEQ ID NO:10134)
5'- A GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 756) (SEQ ID NO:10135)
5'- A GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 757) (SEQ ID NO:10136)
5'- A GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 758) (SEQ ID NO:10137)
10 5'- A GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 759) (SEQ ID NO:10138)
5'- A GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 760) (SEQ ID NO:10139)
5'- A GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 761) (SEQ ID NO:10140)
5'- A GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 762) (SEQ ID NO:10141)
5'- A GGG CGG CAT GGC GGG CAC AG-3' (FRAG 763) (SEQ ID NO:10142)
15 5'- A GGG CGG CAT GGC GGG CAC A-3' (FRAG 764) (SEQ ID NO:10143)
5'- A GGG CGG CAT GGC GGG CAC-3' (FRAG 765) (SEQ ID NO:10144)
5'- A GGG CGG CAT GGC GGG CA-3' (FRAG 766) (SEQ ID NO:10145)
5'- A GGG CGG CAT GGC GGG C-3' (FRAG 767) (SEQ ID NO:10146)
5'- A GGG CGG CAT GGC GGG -3' (FRAG 768) (SEQ ID NO:10147)
20 5'- A GGG CGG CAT GGC GG-3' (FRAG 769) (SEQ ID NO:10148)
5'- A GGG CGG CAT GGC G-3' (FRAG 770) (SEQ ID NO:10149)
5'- A GGG CGG CAT GGC -3' (FRAG 771) (SEQ ID NO:10150)
5'- A GGG CGG CAT GG -3' (FRAG 772) (SEQ ID NO:10151)
5'- A GGG CGG CAT G -3' (FRAG 773) (SEQ ID NO:10152)
25 5'- A GGG CGG CAT -3' (FRAG 774) (SEQ ID NO:10153)
5'- GGG CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 775) (SEQ ID NO:10154)
5'- GGG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 776) (SEQ ID NO:10155)
5'- GGG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 777) (SEQ ID NO:10156)
5'- GGG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 778) (SEQ ID NO:10157)
30 5'- GGG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 779) (SEQ ID NO:10158)
5'- GGG CGG CAT GGC GGG CAC AGG C-3' (FRAG 780) (SEQ ID NO:10159)
5'- GGG CGG CAT GGC GGG CAC AGG -3' (FRAG 781) (SEQ ID NO:10160)
5'- GGG CGG CAT GGC GGG CAC AG-3' (FRAG 782) (SEQ ID NO:10161)
5'- GGG CGG CAT GGC GGG CAC A-3' (FRAG 783) (SEQ ID NO:10162)
35 5'- GGG CGG CAT GGC GGG CAC-3' (FRAG 784) (SEQ ID NO:10163)
5'- GGG CGG CAT GGC GGG CA-3' (FRAG 785) (SEQ ID NO:10164)
5'- GGG CGG CAT GGC GGG C-3' (FRAG 786) (SEQ ID NO:10165)
5'- GGG CGG CAT GGC GGG -3' (FRAG 787) (SEQ ID NO:10166)
5'- GGG CGG CAT GGC GG-3' (FRAG 788) (SEQ ID NO:10167)
40 5'- GGG CGG CAT GGC G-3' (FRAG 789) (SEQ ID NO:10168)
5'- GGG CGG CAT GGC -3' (FRAG 790) (SEQ ID NO:10169)
5'- GGG CGG CAT GG -3' (FRAG 791) (SEQ ID NO:10170)
5'- GGG CGG CAT G -3' (FRAG 792) (SEQ ID NO:10171)
5'- GG CGG CAT GGC GGG CAC AG G CTG GGC-3' (FRAG 793) (SEQ ID NO:10172)
45 5'- GG CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 794) (SEQ ID NO:10173)
5'- GG CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 795) (SEQ ID NO:10174)
5'- GG CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 796) (SEQ ID NO:10175)
5'- GG CGG CAT GGC GGG CAC AGG CT-3' (FRAG 797) (SEQ ID NO:10176)
5'- GG CGG CAT GGC GGG CAC AGG C-3' (FRAG 798) (SEQ ID NO:10177)
50 5'- GG CGG CAT GGC GGG CAC AGG -3' (FRAG 799) (SEQ ID NO:10178)
5'- GG CGG CAT GGC GGG CAC AG-3' (FRAG 800) (SEQ ID NO:10179)
5'- GG CGG CAT GGC GGG CAC A-3' (FRAG 801) (SEQ ID NO:10180)
5'- GG CGG CAT GGC GGG CAC-3' (FRAG 802) (SEQ ID NO:10181)
5'- GG CGG CAT GGC GGG CA-3' (FRAG 803) (SEQ ID NO:10182)
55 5'- GG CGG CAT GGC GGG C-3' (FRAG 804) (SEQ ID NO:10183)
5'- GG CGG CAT GGC GGG -3' (FRAG 805) (SEQ ID NO:10184)
5'- GG CGG CAT GGC GG-3' (FRAG 806) (SEQ ID NO:10185)
5'- GG CGG CAT GGC G-3' (FRAG 807) (SEQ ID NO:10186)
5'- GG CGG CAT GGC -3' (FRAG 808) (SEQ ID NO:10187)
60 5'- GG CGG CAT GG -3' (FRAG 809) (SEQ ID NO:10188)
5'- G CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 810) (SEQ ID NO:10189)
5'- G CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 811) (SEQ ID NO:10190)
5'- G CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 812) (SEQ ID NO:10191)
5'- G CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 813) (SEQ ID NO:10192)
65 5'- G CGG CAT GGC GGG CAC AGG CT-3' (FRAG 814) (SEQ ID NO:10193)
5'- G CGG CAT GGC GGG CAC AGG C-3' (FRAG 815) (SEQ ID NO:10194)
5'- G CGG CAT GGC GGG CAC AGG -3' (FRAG 816) (SEQ ID NO:10195)
5'- G CGG CAT GGC GGG CAC AG-3' (FRAG 817) (SEQ ID NO:10196)
5'- G CGG CAT GGC GGG CAC A-3' (FRAG 818) (SEQ ID NO:10197)
70 5'- G CGG CAT GGC GGG CAC-3' (FRAG 819) (SEQ ID NO:10198)
5'- G CGG CAT GGC GGG CA-3' (FRAG 820) (SEQ ID NO:10199)
5'- G CGG CAT GGC GGG C-3' (FRAG 821) (SEQ ID NO:10200)
5'- G CGG CAT GGC GGG -3' (FRAG 822) (SEQ ID NO:10201)
5'- G CGG CAT GGC GG-3' (FRAG 823) (SEQ ID NO:10202)
75 5'- G CGG CAT GGC G-3' (FRAG 824) (SEQ ID NO:10203)

5'-	G CGG CAT GGC -3' (FRAG 825) (SEQ ID NO:10204)
5'-	CGG CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 826) (SEQ ID NO:10205)
5'-	CGG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 827) (SEQ ID NO:10206)
5'-	CGG CAT GGC GGG CAC AGG CTG G-3' (FRAG 828) (SEQ ID NO:10207)
5	5'- CGG CAT GGC GGG CAC AGG CTG -3' (FRAG 829) (SEQ ID NO:10208)
5'-	CGG CAT GGC GGG CAC AGG CT-3' (FRAG 830) (SEQ ID NO:10209)
5'-	CGG CAT GGC GGG CAC AGG C-3' (FRAG 831) (SEQ ID NO:10210)
5'-	CGG CAT GGC GGG CAC AGG -3' (FRAG 832) (SEQ ID NO:10211)
5'-	CGG CAT GGC GGG CAC AG-3' (FRAG 833) (SEQ ID NO:10212)
10	5'- CGG CAT GGC GGG CAC A-3' (FRAG 834) (SEQ ID NO:10213)
5'-	CGG CAT GGC GGG CAC-3' (FRAG 835) (SEQ ID NO:10214)
5'-	CGG CAT GGC GGG CA-3' (FRAG 836) (SEQ ID NO:10215)
5'-	CGG CAT GGC GGG C-3' (FRAG 837) (SEQ ID NO:10216)
5'-	CGG CAT GGC GGG -3' (FRAG 838) (SEQ ID NO:10217)
15	5'- CGG CAT GGC GG-3' (FRAG 839) (SEQ ID NO:10218)
5'-	CGG CAT GGC G-3' (FRAG 840) (SEQ ID NO:10219)
5'-	GG CAT GGC GGG CAC AGG C TG GGC-3' (FRAG 841) (SEQ ID NO:10220)
5'-	GG CAT GGC GGG CAC AGG CTG GG-3' (FRAG 842) (SEQ ID NO:10221)
5'-	GG CAT GGC GGG CAC AGG CTG G-3' (FRAG 843) (SEQ ID NO:10222)
20	5'- GG CAT GGC GGG CAC AGG CTG -3' (FRAG 844) (SEQ ID NO:10223)
5'-	GG CAT GGC GGG CAC AGG CT-3' (FRAG 845) (SEQ ID NO:10224)
5'-	GG CAT GGC GGG CAC AGG C-3' (FRAG 846) (SEQ ID NO:10225)
5'-	GG CAT GGC GGG CAC AGG -3' (FRAG 847) (SEQ ID NO:10226)
5'-	GG CAT GGC GGG CAC AG-3' (FRAG 848) (SEQ ID NO:10227)
25	5'- GG CAT GGC GGG CAC A-3' (FRAG 849) (SEQ ID NO:10228)
5'-	GG CAT GGC GGG CAC-3' (FRAG 850) (SEQ ID NO:10229)
5'-	GG CAT GGC GGG CA-3' (FRAG 851) (SEQ ID NO:10230)
5'-	GG CAT GGC GGG C-3' (FRAG 852) (SEQ ID NO:10231)
5'-	GG CAT GGC GGG -3' (FRAG 853) (SEQ ID NO:10232)
30	5'- GG CAT GGC GG-3' (FRAG 854) (SEQ ID NO:10233)
5'-	G CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 855) (SEQ ID NO:10234)
5'-	G CAT GGC GGG CAC AGG CTG GG-3' (FRAG 856) (SEQ ID NO:10235)
5'-	G CAT GGC GGG CAC AGG CTG G-3' (FRAG 857) (SEQ ID NO:10236)
5'-	G CAT GGC GGG CAC AGG CTG -3' (FRAG 858) (SEQ ID NO:10237)
35	5'- G CAT GGC GGG CAC AGG CT-3' (FRAG 859) (SEQ ID NO:10238)
5'-	G CAT GGC GGG CAC AGG C-3' (FRAG 860) (SEQ ID NO:10239)
5'-	G CAT GGC GGG CAC AGG -3' (FRAG 861) (SEQ ID NO:10240)
5'-	G CAT GGC GGG CAC AG-3' (FRAG 862) (SEQ ID NO:10241)
5'-	G CAT GGC GGG CAC A-3' (FRAG 863) (SEQ ID NO:10242)
40	5'- G CAT GGC GGG CAC-3' (FRAG 864) (SEQ ID NO:10243)
5'-	G CAT GGC GGG CA-3' (FRAG 865) (SEQ ID NO:10244)
5'-	G CAT GGC GGG C-3' (FRAG 866) (SEQ ID NO:10245)
5'-	G CAT GGC GGG -3' (FRAG 867) (SEQ ID NO:10246)
45	5'- CAT GGC GGG CAC AGG CTG GGC-3' (FRAG 868) (SEQ ID NO:10247)
5'-	CAT GGC GGG CAC AGG CTG GG-3' (FRAG 869) (SEQ ID NO:10248)
5'-	CAT GGC GGG CAC AGG CTG G-3' (FRAG 870) (SEQ ID NO:10249)
5'-	CAT GGC GGG CAC AGG CTG -3' (FRAG 871) (SEQ ID NO:10250)
5'-	CAT GGC GGG CAC AGG CT-3' (FRAG 872) (SEQ ID NO:10251)
5'-	CAT GGC GGG CAC AGG C-3' (FRAG 873) (SEQ ID NO:10252)
50	5'- CAT GGC GGG CAC AGG -3' (FRAG 874) (SEQ ID NO:10253)
5'-	CAT GGC GGG CAC AG-3' (FRAG 875) (SEQ ID NO:10254)
5'-	CAT GGC GGG CAC A-3' (FRAG 876) (SEQ ID NO:10255)
5'-	CAT GGC GGG CAC-3' (FRAG 877) (SEQ ID NO:10256)
5'-	CAT GGC GGG CA-3' (FRAG 878) (SEQ ID NO:10257)
55	5'- CAT GGC GGG C-3' (FRAG 879) (SEQ ID NO:10258)
5'-	AT GGC GGG CAC AGG CTG GGC-3' (FRAG 880) (SEQ ID NO:10259)
5'-	AT GGC GGG CAC AGG CTG GG-3' (FRAG 881) (SEQ ID NO:10260)
5'-	AT GGC GGG CAC AGG CTG G-3' (FRAG 882) (SEQ ID NO:10261)
5'-	AT GGC GGG CAC AGG CTG -3' (FRAG 883) (SEQ ID NO:10262)
60	5'- AT GGC GGG CAC AGG CT-3' (FRAG 884) (SEQ ID NO:10263)
5'-	AT GGC GGG CAC AGG C-3' (FRAG 885) (SEQ ID NO:10264)
5'-	AT GGC GGG CAC AGG -3' (FRAG 886) (SEQ ID NO:10265)
5'-	AT GGC GGG CAC AG-3' (FRAG 887) (SEQ ID NO:10266)
5'-	AT GGC GGG CAC A-3' (FRAG 888) (SEQ ID NO:10267)
65	5'- AT GGC GGG CAC-3' (FRAG 889) (SEQ ID NO:10268)
5'-	AT GGC GGG CA-3' (FRAG 890) (SEQ ID NO:10269)
5'-	T GGC GGG CAC AGG CTG GGC-3' (FRAG 891) (SEQ ID NO:10270)
5'-	T GGC GGG CAC AGG CTG GG-3' (FRAG 892) (SEQ ID NO:10271)
5'-	T GGC GGG CAC AGG CTG G-3' (FRAG 893) (SEQ ID NO:10272)
70	5'- T GGC GGG CAC AGG CTG -3' (FRAG 894) (SEQ ID NO:10273)
5'-	T GGC GGG CAC AGG CT-3' (FRAG 895) (SEQ ID NO:10274)
5'-	T GGC GGG CAC AGG C-3' (FRAG 896) (SEQ ID NO:10275)
5'-	T GGC GGG CAC AGG -3' (FRAG 897) (SEQ ID NO:10276)
5'-	T GGC GGG CAC AG-3' (FRAG 898) (SEQ ID NO:10277)
75	5'- T GGC GGG CAC A-3' (FRAG 899) (SEQ ID NO:10278)

- 5'- T GGC GGG CAC -3' (FRAG 900) (SEQ ID NO:10279)
 5'- GGC GGG CAC AGG CTG GGC -3' (FRAG 901) (SEQ ID NO:10280)
 5'- GGC GGG CAC AGG CTG GG -3' (FRAG 902) (SEQ ID NO:10281)
 5'- GGC GGG CAC AGG CTG G -3' (FRAG 903) (SEQ ID NO:10282)
 5'- GGC GGG CAC AGG CTG -3' (FRAG 904) (SEQ ID NO:10283)
 5'- GGC GGG CAC AGG CT -3' (FRAG 905) (SEQ ID NO:10284)
 5'- GGC GGG CAC AGG C -3' (FRAG 906) (SEQ ID NO:10285)
 5'- GGC GGG CAC AGG -3' (FRAG 907) (SEQ ID NO:10286)
 5'- GGC GGG CAC AG -3' (FRAG 908) (SEQ ID NO:10287)
 5'- GGC GGG CAC A -3' (FRAG 909) (SEQ ID NO:10288)
 5'- GC GGG CAC AGG CTG GGC -3' (FRAG 910) (SEQ ID NO:10289)
 5'- GC GGG CAC AGG CTG GG -3' (FRAG 911) (SEQ ID NO:10290)
 5'- GC GGG CAC AGG CTG G -3' (FRAG 912) (SEQ ID NO:10291)
 5'- GC GGG CAC AGG CTG -3' (FRAG 913) (SEQ ID NO:10292)
 5'- GC GGG CAC AGG CT -3' (FRAG 914) (SEQ ID NO:10293)
 5'- GC GGG CAC AGG C -3' (FRAG 915) (SEQ ID NO:10294)
 5'- GC GGG CAC AGG -3' (FRAG 916) (SEQ ID NO:10295)
 5'- GC GGG CAC AG -3' (FRAG 917) (SEQ ID NO:10296)
 5'- C GGG CAC AGG CTG GGC -3' (FRAG 918) (SEQ ID NO:10297)
 5'- GGC CAC AGG CTG GG -3' (FRAG 919) (SEQ ID NO:10298)
 5'- C GGG CAC AGG CTG G -3' (FRAG 920) (SEQ ID NO:10299)
 5'- C GGG CAC AGG CTG -3' (FRAG 921) (SEQ ID NO:10300)
 5'- C GGG CAC AGG CT -3' (FRAG 922) (SEQ ID NO:10301)
 5'- C GGG CAC AGG C -3' (FRAG 923) (SEQ ID NO:10302)
 5'- C GGG CAC AGG -3' (FRAG 924) (SEQ ID NO:10303)
 5'- GGC CAC AGG CTG GGC -3' (FRAG 925) (SEQ ID NO:10304)
 5'- GGC CAC AGG CTG GG -3' (FRAG 926) (SEQ ID NO:10305)
 5'- GGC CAC AGG CTG G -3' (FRAG 927) (SEQ ID NO:10306)
 5'- GGC CAC AGG CTG -3' (FRAG 928) (SEQ ID NO:10307)
 5'- GGC CAC AGG CT -3' (FRAG 929) (SEQ ID NO:10308)
 5'- GGC CAC AGG C -3' (FRAG 930) (SEQ ID NO:10309)
 5'- GG CAC AGG CTG GGC -3' (FRAG 931) (SEQ ID NO:10310)
 5'- GG CAC AGG CTG GG -3' (FRAG 932) (SEQ ID NO:10311)
 5'- GG CAC AGG CTG G -3' (FRAG 933) (SEQ ID NO:10312)
 5'- GG CAC AGG CTG -3' (FRAG 934) (SEQ ID NO:10313)
 5'- GG CAC AGG CT -3' (FRAG 935) (SEQ ID NO:10314)
 5'- G CAC AGG CTG GGC -3' (FRAG 936) (SEQ ID NO:10315)
 5'- G CAC AGG CTG GG -3' (FRAG 937) (SEQ ID NO:10316)
 5'- G CAC AGG CTG G -3' (FRAG 938) (SEQ ID NO:10317)
 5'- G CAC AGG CTG -3' (FRAG 939) (SEQ ID NO:10318)
 5'- CAC AGG CTG GGC -3' (FRAG 940) (SEQ ID NO:10319)
 5'- CAC AGG CTG GG -3' (FRAG 941) (SEQ ID NO:10320)
 5'- CAC AGG CTG G -3' (FRAG 942) (SEQ ID NO:10321)
 5'- AC AGG CTG GGC -3' (FRAG 943) (SEQ ID NO:10322)
 5'- AC AGG CTG GG -3' (FRAG 944) (SEQ ID NO:10323)
 5'- C AGG CTG GGC -3' (FRAG 945) (SEQ ID NO:10324)
 5'- TTT TCC TTC CTT TGT CTC TCT TC (FRAG 946) (SEQ ID NO:10325)
 5'- GCT CCC GGC TGC CTG (FRAG 947) (SEQ ID NO:10326)
 5'- CTC GGC CGT GCG GCT CTG TCG CTC CCG GT (FRAG 948) (SEQ ID NO:10327)
 5'- CCG CCG CCC TCC GGG GGG TC (FRAG 949) (SEQ ID NO:10328)
 5'- TGC TGC CGT TGG CTG CCC (FRAG 950) (SEQ ID NO:10329)
 5'- CTT CTG CGG GTC GCC GG (FRAG 951) (SEQ ID NO:10330)
 5'- TGC TGG GCT TGT GGC (FRAG 952) (SEQ ID NO:10331)
 5'- GGC CTC TCT TCT GGG (FRAG 953) (SEQ ID NO:10332)
 5'- CCT GGT CCC TCC GT (FRAG 954) (SEQ ID NO:10333)
 5'- GGT GGC TCC TCT GC (FRAG 955) (SEQ ID NO:10334)
 5'- GCT TGG TCC TGG GGC TGC (FRAG 956) (SEQ ID NO:10335)
 5'- TGC TCT CCT CTC CTT (FRAG 957) (SEQ ID NO:10336)

Human Adenosine A2a Receptor Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'- TGC TTT TCT TTT CTG GGC CTC TGT GGT CTG TTT TTT TCT G GCC CTG CTG GGG CGC TCT CC GCC GCC CGC CTG GCT
 CCC GGB GCC CBT GBT GGG CBT GCC GTG GTT CTT GCC CTC CTT TGG CTG CCG TGC CCG CTC CCC GGC CTC CTG GCG GGT
 GGC CGT TG GGC CCG TGT TCC CCT GGG -GCC TGG GGC TCC CTT CTC TC GCC CTT CTT GCT GGG CCT C TGC TGC TGC TGG
 TGC TGT GGC CCC C GTA CAC CGA GGA GCC CAT GAT GGG CAT GCC ACA GAC GAC AGG C GTB CBC CGB GGB GCC CBT
 GBT GGG CBT GCC BCB GBC GBC BGG C -3' (FRAG. NO. 1665) (SEQ ID NO:11049)
 5'- CTG GGC CTC -3' (FRAG 1666) (SEQ ID NO:11050)
 5'- TGC TTT TCT TTT CTG GGC CTC -3' (FRAG 958) (SEQ ID NO:10337)
 5'- TGT GGT CTG TTT TTT TCT G -3' (FRAG 959) (SEQ ID NO:10338)
 5'- GCC CTG CTG GGG CGC TCT CC -3' (FRAG 960) (SEQ ID NO:10339)
 5'- GCC GCC CGC CTG GCT CCC -3' (FRAG 961) (SEQ ID NO:10340)
 5'- GGB GCC CBT GBT GGG CBT GCC -3' (FRAG 962) (SEQ ID NO:10341)
 5'- GTG GTT CTT GCC CTC CTT TGG CTG -3' (FRAG 963) (SEQ ID NO:10342)
 5'- CCG TGC CCG CTC CCC GGC -3' (FRAG 964) (SEQ ID NO:10343)
 5'- CTC CTG GCG GGT GGC CGT TG -3' (FRAG 965) (SEQ ID NO:10344)
 5'- GGC CCG TGT TCC CCT GGG -3' (FRAG 966) (SEQ ID NO:10345)
 5'- GCC TGG GGC TCC CTT CTC TC -3' (FRAG 967) (SEQ ID NO:10346)

5'-GCC CTT CTT GCT GGG CCT C-3' (FRAG 968) (SEQ ID NO:10347)

5'-TGC TGC TGG TGC TGT GGC CCC C-3' (FRAG 969) (SEQ ID NO:10348)

5'-GTACACCGAGGAGCCCATGATGGGCATGCCACAGACGACAGGC-3' (FRAG 970) (SEQ ID NO:10349)

5'-GTBCBCCGGBGGCCCBTGBTGGGCBTGGCCBGBGCBGCGC-3' (FRAG 971) (SEQ ID NO:10350)

5 Human Adenosine A2b Receptor Nucleic Acid & Antisense Oligonucleotide Fragments

5'-GGC GCC GTG CCG CGT CTT GGT GGC GGC GG GTT CGC GCC CGC GCG GGG CCC CTC CGG TCC GTT CGC GCC CGC GCG
GGG CCC CTC CGG TCC CGG GTC GGG GCC CCC CGC GGC C GCC TCG GGG CTG GGG CGC TGG TGG CCG GG CCG CGC CTC
CGC CTG CCG CTT CTG GCT GGG CCC CGG GCG CCC CCT CCC CTC TTG CTC GGG TCC CCG TG ACA GCG CGT CCT GTG TCT
CCA GCA GCA TGG CCG GGC CAG CTG GGC CCC BCB GCG CGT CCT GTG TCT CCB GCB GCB TGG CCG GGC CBG CTG GGC
10 CCC CCCAGCCCCG AGGCTCAGAA GCGGCAGGCG GAGGCGCGGT CCGGGCGCTA TGGCCATGCC CGGCGGGTCT
CACGCGGGCT CCCCTCGCCC GGCAGCGCTT CGGTAGGGGG CGCCCGGGG CCAGCTGGCC CGGCCATGCT GCTGGAGACA
CAGGACGCGC GTGACGTGGC GCTGGAGCTG GTCATCGCCG CGCTTTCGGT GGCGGGCAAC GTGCTGGTGT GCGCGCCGGT
GGGACGCGCG AACACTCTGC AGACGCCAC CAACTACTTC CTGGTGTCCC TGGCTGCGGC CGACGTGGCC GTGGGGCTCT
TCGCCATCCC CTTTGCCATC ACCATCAGCC TGGGCTTCTG CACTGACTTC TACGGCTGCC TCTTCTCGC CTGCTTCTGT
15 CTGGTGTGCA CGCAGAGCTC CATCTTACG CTCTTGCCG CTCTGAGTGA CAGATACCTG GCCATCTGTG TCCCGCTCAG
GTATAAAAGT TTGGTACGGG GGACCCGAGC AAGAGGGGTC ATTGCTGTCC TCTGGGTCTT TGCCCTTTGGC ATCGGATTGA
CTCCATTCTT GGGGTGGAAC AGTAAAGACA GTGCCACCA CACTGCACA GAACCTGGG ATGGAACCAC GAATGAAAGC
TGCTGGTTAC GTGATGTCT CTTTGAGAAT TTGGTGTCTT GGTGTCTTGT AATTTCTTGT GGTGTGTCTT
GCCCCACTG CTTATAATGC TGGTGTATCA CATTAAAGATC TTCTGTGGT CCGTGCAGGCA GCTTCAGCGC ACTGAGCTGA
20 TGGACCACTC GAGGACCACC CTCCAGCGGG AGATCCATGC AGCCAAGTCA CTGGCCATGA TTGTGGGGAT TTTTGCCCTG
TGCTGGTTAC CTGTGCATGC TGTAACTGT GTCATCTTTC TCAGGCCAGC TCAGGGTAAA AATAAGCCCA AGTGGGCAAT
GAATATGGCC ATTCTTCTGT CACATGCCAA TTCAGTTGTC AATCCATTG TCTATGCTTA CCGGAACCGA GACTTCCGCT
ACACTTTTCA CAAAATTATC TCCAGGTATC TTCTCTGCA AGCAGATGTC AAGAGTGGGA ATGGTCAGGC TGGGGTACAG
CCTGCTCTCG GTGTGGGCT ATGATCTAGG CTCTCGCCTC TTCAGGAGA AGATACAAAT CCACAAGAAA CAAAGAGGAC
25 ACGGCTGGTT TCAATTGTGA AAGATAGCTA CACCTCACA GGAATAGGAC TGCTCTCTT GAGCACTTC CTGAGCTAC
CACGTATCTA GCTAATATGT ATGTGTCAGT AGTAGCACA AGGATTGACA AATATATTTA TGATCTATTC AGTCTCTTT
ACTGTGTGGA TTATGCCAAC AGCTTGAATG GATTCTAACA GACTCTTTT TTTTAAAG TCTGCTTGT TTATGGTGGG
AAATTAAGTGA AACTATTTA CTGTGAACA GTGTGAAC TAATAATGCA AATACTTTT AACTTAGAGG CAATGAAAA
ATAAAGTTG ACTGTACTAA AAATGTATAC TTGTGTCAG GAAGGTGACC TCAAAAATTA AAAGTATAAT TATTCGGCCG
30 GGCCTGGTGG CACACACTG TAATTCACG ACTTTGGGAG CCAAGGACG GCGGATCAC AGGTCAAGGAG TCAAAAACCA
GCCTGTCAA TATAGTG GGGCAATTG TTAGTTATCC GCGGCCACCA AGACGCGGCA CCGCGCCTGG ACCGAGGGG
CCCCGCGCGC GCGCAACTT TGGGCTCGGG CGAGTGGGTG GTGCTCCGCC CAGCCGAGA CCGGCGGGCG CCGCGGCCAA
TGGGTGCCCG CTCTTGCCG CGGGGGGCC CGACCCGTGG GTCCCGGCA CAGCGCCCC AGCCCCGAGG CTCAGAAGCG
GCAGGCGGAG GCGCGGTCCG GCGCTATGG CCAATGCCCG CCGGTCTCAC GCGCTGCC CCGCGCCGCG GCGCTTGG
35 TAGGGGGCGC CCGGGGCCCA GCTGGCCCG CCAATGCTCTG GAGACACAG GACGCGCTGT ACGTGGCGCT GGAGCTGGT
ATCGCCGCGC TTTCGGTGGC GGGCAACGTC CTGGTGTGCG CCGCGGTGG CACGGCAAC ACTCTGCAG CGCCACCA
CTACTTCTG GTGTCCCTG CTGCGGCCG CGTGCCGCTG GGGCTCTCG CCAATCCCTT TGCCATCACC ATCAGCCTG
GCTTCTGAC TACTTCTAC GGCTGCCTCT TCCTCGCCTG CTCTGTGCTG GTGCTCAGC AGAGCTCCAT CTTCAGCCTT
CTGGCGGTGG CAGTGCACAG ATACCTGGCC ATCTGTGCTC CGTCAAGTA TAAAGATTG GTCAAGGGA CCGGACCAAG
40 AGGGGTCAAT GCTGTCTCT GGTCTCTTG CTTTGGCATC GGATTGACTC CATTCTGGG GTGGAACAGT AAAGACAGT
CCACCAACAA CTGCACAGAA CCCTGGGATG GAACCAAGAA TGAAGCTGC TGCTTGTGA AGTGTCTCT TGAAGATTG
GTCCCAATGA GCTACATGGT ATATTCAAT TCTTTGGGT GTGTTCTGCC CCACTGCTT ATAATGCTGT TGATCTACAT
TAAGATCTTC CTGGTGGCT GCAGGCAGCT TCAGCGCACT GAGCTGATG ACCACTCGAG GACCACCCTC CAGCGGAGA
TCCATGACG CAAGTCACTG GCCATGATTG TGGGGATTIT TGCCCTGTG TGGTTACCTG TGCATGCTGT TAACGTGTG
45 ACTCTTTTCC AGCCAGCTCA GGGTAAAAAT AAGCCCAAGT GCGCAATGAA TATGGCCATT CTCTGTGCA ATGCAATTC
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 55 TGCTGTACAT GGGCATCCTG CTGTCCCATG CCAACTCCAT GATGAACCC ATCGTCTATG CCTATAAAAT AAAGAAGTTC
 AAGGAAACCT ACCTTTTAT CCTCAAAGCC TGTGTGCTCT GCCATCCCTC TGATTCCTTG GACACAAGCA TTGAGAAGAA
 TTCTGAGTAG TTATCCATCA GAGATGACTC TGTCTCATG ACTTTCAGAT TCCCATCAA CAAACACTCA AGGGCCTGTA
 TGCTGGGCC AAGGGATTTT TACATCCTTG ATTACTTCCA CTGAGGTGGG AGCATCTCCA GTGCTCCCA ATTATATCTC
 CCCCCTCCA CTACTCTCTT CCTCCACTTC ATTTTCTCT TGTCTTCT CTCTAATTA GTGTTTGGG GGCTGACTT
 GGGGCAACG TATATTGAT ATTATTGCT GTTTTCTCT TTCCCAATAG AAGAATAAGT CATGGAGCTC GAAGGGTGCC
 60 TAGTTGACTT ACTGACAAA GGCTCTAGTT GGGCTGAACA TGTGTGTGGT GGTGACTCAT TTCCATGCCA TTGTGGAATT
 GAGCAGAGAA CTGCTCTCG GAGGATGCCT AGGAGATGTT GGAACAGAA GAAATAAAT GAGTTTAAAG GGGACTTAAA
 CTGCTGAATT C -3' (FRAG. NO.:) (SEQ ID NO:11796)
 5'-TTCCAG ATGGGCGAGG GTGGCTGGGC TGGTGACCCT AAGTGTGTCT CCTGCCCTTA TTCTCTCTAG TGGGTTATTC
 TTTTATGTGG TATCTTGCCCT ACAGCATGCT GTGTTTGGAC ACAAAACCCCT TTCCTTGGTT TCTCTGACCC AGCTGAGATG
 65 GACTGATTCC AAAAGAACTC ACCTATGTAC TGGGGTAGGG GAGGGAGGGT TTTTTCAGT ATTTAACTAA GGTTCAAAGA
 GTGCTATATA GTGAGAAAGG CTCTTTTTTT TTTTITTTTT TTTTITGGCA GAGTGCTGCC TCCTAGAAAT TTCTCTGGT
 AACTTCCTTC TCTGAAGCAC AGATAAAGAA AACAATTACA GTAGAAACAT TTATGAGGGA CACATTGGAG GCCGATGAAG
 CTTTTCAAGT TCCAGCAGTG CAGGGATGTG GGCAGAACTG ACATTGGAAA ATACTAGAAT GATGGAAAT CAGTTGGAGA
 GGACTGCCCT TTTAATGTC TGGGGAGTCT GCTCAGGGAG AATGACAAAG TCTGGCGGGG ACAAGTATGG GATTGGGTAA
 70 GACTTGGATC AACTTGGGAT ACAGGGTGGG GGTGCGGAGT GGAATCAATG AATGATGCCA GAGCAGATCA ACTAACAAGA
 GGACCTGTAT GAGCCCCAGG CAGAGGCGTC TCCCTATGTC CCCACTCTGA AGTGTITGTT AGTAAACACC AGAAGCCGAT
 TGTGTCTACT GCTGAATTTT ATTTTGGGCT GTACATATTT AGATGCTTAA GGTAAAAATG ATAAAGCCCT CAAGCCACTG
 TGTGGGTTTG GGTCCAAAGT TCTCTTCTTG CTGCCCTCTT AACACGCCCT GTTAAAAATA TCCCTTTTGA TGGTGCTGAG
 AAGCACTGTA ACCAAGTGGG TCCCAAAATA ACAATGGCGT GCAAGTGTCT GGTTCACAGA AGTTGGTGAC TAGGTAAAGCA
 75 GCTTCAGGGA GAGGGGGCTG ATTCACAGAC AGTCGCGCTG TCCTGCGGGG ATGGGGCTGA GGCTTGGGA ATGTGGGACG

- GAGGATATGC CATTGTATTC TGTGACACAC GTTCTTTTCC CTCTTTCTG TATGCTGGT CATTCTGCTA TTCTGCTGT
CCTCACATAG GTTGGACATT GGCCGGCTGC CAGCATAAGT GCCAGTGTGA TTTTGCTAGG TGTGAGCTGA GAAAGAGAGG
TGGAGGCTAA GCAGGTGTGA TGCTTCTCAG AGGTGCTGAG TTTTGCCCT TCTGAGCAGG GAATCTTTGC TTATCCCTTT
5 GACCAAGGAT CTTTGCTGCA AAGGCTGGT ATCGGCTGTG CTCAGCAAAG CGTCAACTCG TGCAAGAACT TACGAGGAAT
AGTTCTGGCT AAGGTTAGGA GGCTGCCACC AAAGTCTCTT TTTTGTCTT CTGCTTCTCC CGTTTGCCTC CTTATCATGA
GATCTTTTGG CTAAGCTGGC AGAAAGATTG CATAGTCAGT GCTTCCAGCT CTGCTCCAC CTGATCCTGC ACTGCTCTCT
GGTCCCTGAA TGAATGAACT CTGATACCCA ATCTTGTCTC GAGCCTTCTC TATGCCACTC ATGGCTCCTC TTCTGCTCTT
TCCATCTTTT TGCTGAGAGT TCTGAGCTCT GTACTTCCCT TTGGCCCATC TCACTTCTG AAACACCCCT GAAAGGGGTT
GCTTATCTTG ATGGAATCA AAAAGCCAAA AAGCTGCAGG CAGAGGCGTT GAGGACATCT GTTTGGGGAA CTAAGAGCAG
10 CAGCACTTTC AGATTCAGTC CATATAGAGC TGCTCTACAG CATTCTGGAA ACTTGAGGAT GTGCGGTGCA TAAAGGGGCT
GGAAAGTGACC CACCTGTGAT GAGCCCTTTC TAAGGAGAAAG GGTTTCCAAAG AGATCACCCC ACCAGAAAAG GGTAGGAATG
AGCAAGTTGG GAATTTTAGA CTGTCACTGC ACATGGACCT CTGGGAAGAC GTCTGGCGAG GCTAGGCC ACTGGCCCTA
CAGACGGATC TTGCTGGCTC ACCTGTCCCT GTGGAGGTTT CCTGGGAAG GCAAGATGCC CAACAACAGC ACTGCTCTGT
CATTGGCCAA TGTATCTAC TCACCATGG AAATTTTCA TGGACTCTGC GCCATAGTGG GCAACGTGCT GCAATCTGC
15 GTGGTCAAGC TGAACCCAG CCTGCAGACC ACCACCTTCT ATTTCAATTG CTCTCTAGCC TGGCTGACA TTGCTGTGG
GGTGTCTGTC ATGCCCTTGG CCAATTGTGT CAGCCTGGGC TCACAATCC ACTTCTACAG CTGCTCTTTT ATGACTTGCC
TACTGCTTAT CTITACCCAC CTTCCATCA GTCTTCTGCT GGCCATCGCT GTGGACCGAT ACTTGCTTTT CAAGCTTACC
GTCAGGTAGC CTGCGGCGTG GGTGGGCGAG CAATTGAGGC AGCTGGGAAA TGAGGCTACA AGCCAGAGC-3' (FRAG. NO.:) (SEQ
ID NO:12484)
- 20 5'-GGGCAATTTG TTAGTTATCC GCGGCCACCA AGACGCGGCA CGGCGCTGG ACCGGAGGGG CCCCGCGCGG GCGCGAAGCTT
TGGGCTCGGG CGAGTGGGTG GTGCTCCGCC CAGCCCGAGA CGGGCGGGCG CGCGGGCCAA TGGGTGCCG CTCTTGGCCG
CGGGGGGGCC CGACCCGTGG GTCCCGGCCA CCAGCGCCCC AGCCCCGAGG CTCAGAAGCG GCAGGCGGAG GCGCGGTCCG
GGCGCTATGG CCATGCCCGG CGGGTCTCAC CGGCTTCCCT CTGCGCCGCG GCGCCTTCGG TAGGGGCGCG CCGGGGCCA
GCTGGCCCGG CCATGCTGCT GGAGACACAG GACGCGCTGT ACGTGGCGCT GGAGCTGGTC ATCGCCGCGC TTTGGGTGGC
25 GGGCAACGTG CTGGTGTGCG CCGCGGTGGG CACGGCGAAT ACTCTGAGA CGCCACCAA CTACTTCTGT GTGTCCCTGG
CTGCGGCCGA CGTGGCCGTG GGGCTCTTCG CCATCCCTGT TGCCATCACC ATCAGCCTGG GCTTCTGAC TACTTCTAC
GGTGCCTCT TCTCGCCTG CTTCGTGCTG GTGCTACGC AGAGCTCCAT CTTAGCCTT CTGGCCGTGG CAGTCGACAG
ATACCTGGCC ATCTGTGTCC CGCTCAGGTA TAAAAGTTTG GTACAGGGGA CCCGAGCAAG AGGGGTCAAT GCTGTCTCT
GGTCTTGG CTTTGGCATC GGATTGACTC CATTCTGGG GTGGAACAGT AAAGACAGT CCACCAACAA CTGCACAGAA
30 CCCTGGGATG GAACACGAA TGAAGCTGC TGCCTTGTGA AGTGTCTCT TGAAGATGTG GTCCCCATGA GCTACATGGT
ATATTTCAAT TCTTTGGGT GTGTTCTGCC CCCACTGCTT ATAATGCTGG TGATCTACAT TAAGATCTC CTGGTGGCT
GCAGGCAGCT TCAGCGCACT GAGCTGATGG ACCACTCGAG GACCACCTC CAGCGGAGA TCCATGCAGC CAAGTCACTG
GCCATGATG TGGGGATTTT TGCCCTGTGC TGGTTACCTG TGCATGCTGT TAACTGTGTC ACTCTTTTCC AGCCAGCTCA
GGGTAAAAAT AAGCCCAAGT GGGCAATGAA TATGGCCATT CTCTGTGAC ATGCCAATTC AGTTGTCAAT CCCATGTCT
35 ATGCTTACCG GAACCGAGAC TTCCGCTACA CTTTACAA AATTATCTCC AGGTATCTTC TCTGCCAAG AGATGTCAAG
AGTGGGAATG GTCAGGCTGG GGTACAGCCT GCTCTCGGTG TGGGCCATG ATCTAGGCTC TCGCCTCTC CAGGAGAGA
TACAAATCCA CAAGAAACAA AGAGGACACG GCTGGTTTTC ATTTGAAAG ATAGTACAC CTCACAAGGA AATGGAGCTG
CTCTCTTGG CACTTCCCTG GAGCTACCAC GTATCTAGCT AATATGTATG TGTAGTAGT AGGCTCCAAG GTTGACAAA
TATATTTATG ATCTATTCAG CTGCTTTTAC TGTGTGGATT ATGCCAACAG CTGGAATGGA TTCTAACAGA CTTCTTTTGT
40 TTTAAAGTGC TGCCCTGTGT ATGGTGGAAA ATTACTGAAA CTATTTTACT GTGAAACAGT GTGAACTATT ATAATGCAAA
TACTTTTAA CTTAGAGGCA ATGAAAAT AAAAGTTGAC TGTACTAAAA ATG-3'(FRAG. NO.:)(SEQ ID NO:11794)
- 5'-GBG CB TGC-3' (FRAG. NO:1676) (SEQ ID NO:11060)
5'-TTG TTG GGC-3' (FRAG. NO:1677) (SEQ ID NO:11061)
5'-TGC CTT CCC BGG G-3' (FRAG. NO:1678) (SEQ ID NO:11062)
- 45 5'-GTT GTT GGG CAT CTT GCC-3' (FRAG. NO:1679) (SEQ ID NO:9372)
5'-GTG GGC CTA GCT CTC GCC-3' (FRAG. NO:1680) (SEQ ID NO:9374)
5'-ACA GAG CA TGC TGT TGT TGG GCA TCT TGC CTT CCC AGG G-3' (FRAG 982) (SEQ ID NO:10361)
5'-BCB GBG CB TGC TGT TGT TGG GCB TCT TGC CTT CCC BGG G-3' (FRAG 983) (SEQ ID NO:10362)
5'-CCC TTT TCT GGT GGG GTG-3' (FRAG 984) (SEQ ID NO:10363)
- 50 5'-GTG CTG TTG TTG GGC-3' (FRAG 985) (SEQ ID NO:10364)
5'-TTT CTT CTG TTC CC-3' (FRAG 986) (SEQ ID NO:10365)
5'-CCC TTT TCT GGT GGG GTG-3' (FRAG 987) (SEQ ID NO:10366)
5'-GTG CTG TTG TTG GGC-3' (FRAG 988) (SEQ ID NO:10367)
5'-TTT CTT CTG TTC CC-3' (FRAG 989) (SEQ ID NO:10368)
- 55 **Human IgE Receptor (Nucleic Acid and Antisense Oligonucleotide Fragments)**
5'-TTT CCC CTG GGT CTT CC CTC CTG CTC TTT TTT C ATT TGC TCT CCT ATT ACT TTC TGT GTC CAT TTT TTC ATT AAC CGA
GCT GT BTT TGC TCT CCT BTT BCT TTC TGT GTC CBT TTT TTC BTT BBC CGB GCT GT-3' (FRAG. NO:1681) (SEQ ID NO:11063)
5'-CCC CTG GG-3' (FRAG. NO:1682) (SEQ ID NO:11064)
5'-GCTCTCCTBTT-3' (FRAG. NO:1683) (SEQ ID NO:11065)
60 5'-CBTTBBCCBGCTG-3' (FRAG. NO:1684) (SEQ ID NO:11066)
5'-TTT CCC CTG GGT CTT CC-3' (FRAG 990) (SEQ ID NO:10369)
5'-CTC CTG CTC TTT TTT C-3' (FRAG 991) (SEQ ID NO:10370)
ATTGCTCTCTATTACTTTCTGTGTCATTTTTTCATTAAACCGAGCTGT (FRAG 992) (SEQ ID NO:10371)
BTTTGTCTCTCTBTTBCTTTCTGTGTCBTTTTCBTTBBCCBGCTGT (FRAG 993) (SEQ ID NO:10372)
- 65 **Human Fe- (Receptor CD23 Antigen (IgE Receptor)**
Nucleic Acid and Antisense Oligonucleotide Fragments
5'-GCC TGT GTC TGT CCT CCT GCT TCG TTC CTC TCG TTC CTG CTT GGT GCC CTT GCC G GTC CTG CTC CTC CGG GCT GTG G
GTC GTG GCC CTG GCT CCG GCT GGT GGG CTC CCC TGG CCT TCG CTG GCT GGC GGC GTG C GGG TCT TGC TCT GGG CCT
GGC TGT GGC CGT GGT TGG GGG TCT TC GCT GCC TCC GTT TGG GTG GC TCT CTG AAT ATT GAC CTT CCT CCA TGG CGG
70 TCC TGC TTG GAT TCT CCC GA TCT CBT BTT GBC CTT CCT CCB TGG CGG TCC TGC TTG GBT TCT CCC GB-3'(FRAG
1685)(SEQ ID NO:11067)
5'-GT CCT CCT-3' (FRAG 1686) (SEQ ID NO:11068)
5'-TGT GTC TGT CCT CC-3' (FRAG 1687) (SEQ ID NO:11069)
5'-GTG GCC CTG GC-3' (FRAG 1688) (SEQ ID NO:11070)

- 5'-CGT GGT TGG GG-3' (FRAG 1689) (SEQ ID NO:11071)
 5'-TCT CTG BBT BTT GBC C-3' (FRAG1690) (SEQ ID NO:11072)
 5'-GCC TGT GTC TGT CCT CCT-3' (FRAG 994) (SEQ ID NO:10373)
 5'-GCT TCG TTC CTC TCG TTC-3' (FRAG 995) (SEQ ID NO:10374)
 5'-CTG CTT GGT GCC CTT GCC G-3' (FRAG 996) (SEQ ID NO:10375)
 5'-GTC CTG CTC CTC CGG GCT GTG G-3' (FRAG 997) (SEQ ID NO:10376)
 5'-GTC GTG GCC CTG GCT CCG GCT GGT GGG CTC CCC TGG-3' (FRAG 998) (SEQ ID NO:10377)
 5'-CCT TCG CTG GCT GGC GGC GTG C-3' (FRAG 999) (SEQ ID NO:10378)
 5'-GGG TCT TGC TCT GGG CCT GGC TGT-3' (FRAG 1000) (SEQ ID NO:10379)
 5'-GGC CGT GGT TGG GGG TCT TC-3' (FRAG 1001) (SEQ ID NO:10380)
 5'-GCT GCC TCC GTT TGG GTG GC (FRAG 1002) (SEQ ID NO:10381)
 5'-TCT CTG AAT ATT GAC CTT CCT CCA TGG CGG TCC TGC TTG GAT TCT CCC GA (FRAG 1003) (SEQ ID NO:10382)
 5'-TCT CTG BBT BTT GBC CTT CCT CCB TGG CGG TCC TGC TTG GBT TCT CCC GB (FRAG 1004) (SEQ ID NO:10383)
- Human IgE Receptor (Subunit Nucleic Acid and Antisense Oligonucleotide Fragments**
- 5'-GCC TTT CCT GGT TCT CTT GTT GTT TTT GGG GTT TGG CTT ACA GTA GAG TAG GGG ATT CCA TGG CAG GAG CCA TCT
 TCT TCA TGG ACT CC TTC AAG GAG ACC TTA GGT TTC TGA GGG ACT GCT AAC ACG CCA TCT GGA GC BCB GTB GBG TBG
 GGG BTT CCB TGG CBG GBG CCB TCT TCT TCB TGG BCT CC TTC BBG GBG BCC TTB GGT TTC TGB GGG BCT GCT BBC BCG
 CCB TCT GGB GC CTT GTT TTT GGG GTT TGG CTT GCC TTT CCT GGT TCT CTT BCB GTB GBG TBG GGG BTT CCB TGG CBG
 GBG CCB TCT TCT TCB TGG BCT CC TTC BBG GBG BCC TTB GGT TTC TGB GGG BCT GCT BBC BCG CCB TCT GGB GC-3'
 (FRAG. NO: 1691) (SEQ ID NO:11073)
 5'-TGG BCT CC-3' (FRAG. NO: 1692) (SEQ ID NO:11074)
 5'-CCB TCT GGB-3' (FRAG. NO: 1693) (SEQ ID NO:11075)
 5'-CT GCT BBC BCG-3' (FRAG. NO: 1694) (SEQ ID NO:11076)
 5'-GTT TTT GGG GTT TG-3' (FRAG. NO: 1695) (SEQ ID NO:11077)
- 5'-GCC TTT CCT GGT TCT CTT GTT GTT TTT GGG GTT TGG CTT-3' (FRAG. NO:1005) (SEQ ID NO:10384)
 5'-ACAGTAGAGTAGGGGATTCCATGGCAGGAGCCATCTTCTTCATGGACTCC-3' (FRAG. NO:1006) (SEQ ID NO:10385)
 5'-TTC AAG GAG ACC TTA GGT TTC TGA GGG ACT GCT AAC ACG CCA TCT GGA GC-3' (FRAG. NO:1007) (SEQ ID NO:10386)
 5'-BCB GTB GBG TBG GGG BTT CCB TGG CBG GBG CCB TCT TCT TCB TGG BCT CC TTC BBG GBG BCC TTB GGT TTC TGB
 GGG-3' (FRAG. NO:1008) (SEQ ID NO:10387)
- 5'-BCT GCT BBC BCG CCB TCT GGB GC-3' (FRAG. NO:1009) (SEQ ID NO:10388)
 5'-GTT GTT TTT GGG GTT TGG CTT-3' (FRAG. NO:1010) (SEQ ID NO:10389)
 5'-GCC TTT CCT GGT TCT CTT-3' (FRAG. NO:1011) (SEQ ID NO:10390)
 5'-BCBGTBGBGTBGGGGBTTCBTTGCBGGBGCCBCTCTTCTCBTGGBCCTCC-3' (FRAG. NO:1012) (SEQ ID NO:10391)
 5'-TTC BBG GBG BCC TTB GGT TTC TGB GGG BCT GCT BBC BCG CCB TCT GGB GC-3' (FRAG. NO:1013) (SEQ ID NO:10392)
- Human IgE Receptor (Fc Epsilon R) Nucleic Acid and Antisense Oligonucleotide Fragments**
- 5'-GCC TGT GTC TGT CCT CCT GCT TCG TTC CTC CTG CTT GGT GCC CTT GCC G GTC CTG CTC CTC CGG GCT GTG G
 GTC CTC GCT CCG GCT CCG GCT GGT GGG CTC CCC TGG CCT TCG CTG GCT GGC GGC GTG C CCC BCB BCG BGB CCC GGB
 CCG BCB GGC CGT GGT TGG GGG TCT TC GCT GCC TCC GTT TGG GTG GC GAT CTC TGA ATA TTGA CCT TCC ATG GCG GTC
 CTG CTT GGA GBT CTC TGB BTB TGB CCT TCC BTG GCG GTC CTG CTT GGB-3' (FRAG: 1696) (SEQ ID NO:11078)
 5'-TCG TTC CTC TCG-3' (FRAG: 1697) (SEQ ID NO:12370)
 5'-BGB BCG BGB C-3' (FRAG: 1698) (SEQ ID NO:11080)
 5'-TGB BTB TTGB-3' (FRAG: 1699) (SEQ ID NO:11081)
 5'-GCC TGT GTC TGT CCT CCT-3' (FRAG. NO:1014) (SEQ ID NO:10393)
 5'-GCT TCG TTC CTC TCG TTC-3' (FRAG. NO:1015) (SEQ ID NO:10394)
- 5'-CTG CTT GGT GCC CTT GCC G-3' (FRAG. NO:1016) (SEQ ID NO:10395)
 5'-GTC CTC GCT CTC CGG GCT GTG G-3' (FRAG. NO:1017) (SEQ ID NO:10396)
 5'-GTC CTC GCC CTG GCT CCG GCT GGT GGG CTC CCC TGG-3' (FRAG. NO:1018) (SEQ ID NO:10397)
 5'-CCT TCG CTG GCT GGC GGC GTG C-3' (FRAG. NO:1019) (SEQ ID NO:10398)
 5'-CCC BGB BCG BGB CCC GGB CCG BCB-3' (FRAG. NO:1020) (SEQ ID NO:10399)
- 5'-GGC CGT GGT TGG GGG TCT TC-3' (FRAG. NO:1021) (SEQ ID NO:10400)
 5'-GCT GCC TCC GTT TGG GTG GC-3' (FRAG. NO:1022) (SEQ ID NO:10401)
 5'-GBT CTC TGB BTB TTGB CCT TCC BTG GCG GTC CTG CTT GGB-3' (FRAG. NO:1023) (SEQ ID NO:10402)
- Human High Affinity IgE Receptor Oligonucleotide Fragments**
- 5'-AACAAGAAAA GCGTTGGTAG CTCTGGTGAA TCCCAAAAGA ATGTGGCAGT TGCTAGCCAT GCTCCTGAAT ATGTATAAAC
 AGTACATCAT ATGACTAAGA GTTTGACTTA GGGGTAGAT TTTATGTGT TGAACCCCAA ATTAGTTATT TAATAGTTGG
 CACCCCAAAA CAAGTTACTT AACCTCACTA AGGTTTCAGTT TTCTGTGTTA TAAAATGTAG ATAGTGATAG TATGTACTTT
 ATAGGATTAT TGTGAAAAAT AAATGAAATA TCAGATTAT TTAGGATAAC ACCTGGCATA TGTTTGATAT TCAGAAATTAG
 TTGCTGCTGT TTTATCTGCT TCTCCCTTGC ATCCCACTTT TCTAAGITGT AAATAAATA GTTGACACA GATTGACAGA
 TTAAGAAAGG CTTGTGATTG TGCTAGACCT ATGCCTATGC CTCTGTCTCA CCAGATTCCA GGTGTATATG TGGAGGTGGG
 ATAGGGAGTG GAGTAAGTGG GTAAATATTA AATTGCCGAC TGGGGACCA TCCTGAATAT TATCTCTAAA GAAAGAGCA
 AAACCAGGCA CAGCTGATGG GTTAACCAGA TATGATACAG AAAACATTTC CTCTGCTTT TTGGTTTAA GCCTATATTT
 GAAGCCTTAG ATCTCTCCAG CACAGTAAGC ACCAGGAGTC CATGAAGAAG ATG GATCTTCATG TGGAAATGACT GGTTCATTC
 AATAGACTTA ATTCAGCAGT CTGTGGGGAA GAGCAAGTGA TGATAGAATG GTTCCTCAAG TGCTTCAGAT GTGAAGTGGG
 TTAAATATA CTGTCCCTGT CTCTTCAGA GTTTTGGTAA AGATAAAATA GGACACTCAT TAAAGCAAA TCCTTGCAAA
 TGACAGCCCA CTATAGACAT TAATAGAGTT TTCATTCCA GTATATCAT TAATATCAGA TCCTGGAAGA AGGTTGAGCC
 TTGACCTAGA GCAAAAAAAC AGAAGAATTA GTAAAGGAAT CCTGGAGAAA GCCCCTGCTG TGTATTTAAA GGAGAAAGGG
 AGATCATGTT GGGAAATTAT AATATTAATA GTAAACAAAA GCTAGGAAGT AAAATAAAAT AAATTATATG GCCTAGATCC
 CCATAGTAA TGGTTTAACT TCTGCCCTCC TGTGTCTGA GCCAGATTAG GGCACAGTAG AGAAAGAGGA GTCTCTGAAA
 ATGTTTCCAA TTTCGCTGGT CAGACAGCGG ATCATCAGTG AATCAGATGA AAATTTGTGG ATTTATGCAC TAACCTGATCA
 GCAGGAAATT AAACAAGAAA AGCGTTGGTA GCTCTGGTGA ATCCCAAAAG AATTGGGACG TTGCTAGCCA TGCTCCTGAA
 TATGTATAAA CAGTACATCA TATGACTAAG AGTTTGACTT AGGGGTTAGA TTTTATGTGT TTGAACCCCA AATTAGTTAT
 TTAATAGTTG GCACCCCAAA ACAAGTACT TAACCTCACT AAGATTCACT TTTCCTGTTT ATAAATATGA GATTAGTGATA
 GTATGTACTT TATAGGATTA TTGTGAAAA TAAATGAAAT ATCAGATTTA TTTAGGATAA CACCTGGCAT ATGTTTGGTA
 TTCAGTAAAT AGTTGCTGCT GTTTTATTCT GCTCTCCCTT GCATCCCACT TTCTAAGTT GTAAACTAAA TAGTTGTACA

CAGATTGACA GATTAAGAAA GGCTTGTGAT TGTGCTAGAC CTATGCCTCT CTCTCACCAG ATTCCAGGTG TATATGTGGA
 GGTGGGATAG GGAGTGGAGT AAGTGGGTAA ATATTAAATT GCCCAGTTGG GCACCATCCT GAATATTATC TCTAAAGAAA
 GAAGCAAAAC CAGGCACAGC TGATGGGTAA ACCAGATATG ATACAGAAAA CATTTCCTTC TGCTTTTTGG TTTTAAAGCCT
 5 ATATTGGAAG CCTTAGATCT CTCCAGCACA GTAAGCACA GGAGTCCATG AAGAAGATGG CTCCTGCCAT GGAATCCCT
 ACTCTACTGT GTGTAGCCTT ACTGTCTCTC GGTAAGTAGA GATTCAATTA CCCCTCCCAG GGAGGCCCAA ATGAATTTGG
 GGAGCAGCTG GGGTAGGAAC CTTTACTGTG GGTGGTGAAT TTTTCTAGGA CATGTGCAAA CTATTGGGCA TTTCCAGGG
 ACTCTGTAGT GGAGCCAAGC TAGAAAAGCAG AGGCAAGTGG GCTGAGCAAC ACCTAAGGAG GAAGCCAGAC TGAAAGCTTG
 GTTCTTGCA TTTGCTCTGG CATCTCCAG AGTGCAAAT TCCTACCAAG GTAATGAGGG TAGAGGAGAG AAAGAAGCTC
 10 TTTCTTCCC TGATTCTCAT TCTGAAAAG ACGGTGGTCT CTAAATTC CATGGATGTA GATCTTATCC CCACACCCAG
 TAGCAGGTGA GTCTCTGTG CTTGTCCCT TGGTGTATCA ACATGTCTGG GCATTGCTTT CCTCTCACTA TTTCTCTCGT
 CCCATCACTT CTGCTTTCTA ATGAGCATGA ATCTGTCTCT TGGCCAGACT ACTTTCCTC TCCACCTTGC CTGTCTTTT
 TTTTTTCCC TGATTCTATG CATTCTCTCA AGTCATTCTC TCCTCTGTTT TAGTCAATAA CCATGTCTGT TGCACATATA
 15 CATGTCTCAT TCTCTCTCT AGACACTTGG GCATGATCTC GCTCAATAAT TACATTATTA TTATTATTGC CATTTTATAA
 TGTAGGATGC TGAACCTCAG TGATTTTCTG GTGGTTACAT GGCTAAGGAA CTGGATTTC ACGTAAGTTC CTGGATCTA
 ATGCCAGTTC TCTCTGACT ATATCACCTT TTTGTATATC CATGTATCT ACTTCTTTGG TCTCTGTCCA AATTGTCAC
 ACATCCCTTT GTTCCAGGAA GCCATTCAAG ACTGACTTTC TTAGTGCTCT TCACTACTTT CTGGAAGTGA CATATGTTTT
 TCACTCTGTA TATACCTTACA ATTAATAGT CATAAATATT CAGAGCTTGG AGAAACCTTA TATTTTATCC AGTCCAGTAA
 20 ATTTATCCAT CCATAATTCA CTCATTCAAT CACATAATAT ATATTTAATG TAACAATGGT TGAACATGGC AGCAGTGGT
 TCTACCTCAA AAGAGATTGC AGTCCCTATT TACAGATACT GAATTGAAAT TAACAGAAAT AGAGTGAGTC AGCTCAAATC
 ACATATGTA TTTGGTTCTT TGTTTTTAAA TCTCTGCTAT ATGTGTCTCT TCTTCTCCC TGTGTGGGC GTTCCCTGGG
 GCACCAATAC TATCTTCC TTTCCCTAGA AATCAAAACA GGGTCTTATC ACCAACAGAA TAAGGACAGG TTGACCACTG
 ATTGTGAGAA TATTGCTTCT TTTGTACTTT TAAGCTTACA CAGTTTTCAA TGACTTTTT TCTCTCTACA TCTCTTTTCA
 25 TATTTTTATC TTCTTGAAGT CCCTCAGAAA CCTAAGGTCT CCTTGAACCC TCCATGGAAT AGAATATTTA AAGGAGAGAA
 TGTGACTCT ACATGTAATG GGAACAATTT CTTTGAAGTC AGTTCACCA AATGTTTCCA CAATGGCAGC CTTTGAAG
 AGACAAATTC AAGTTTGAAT ATTTGTAATG CCAATTTTGA AGCAGTGGGA GAATACAAAT GTACAGCACA ATTAAGTAA
 GAGAGTGAAC CTGTGTACCT GGAAGTCTTC AGTGGTAAGT TCCAGGGATA TGGAAATACA GATCTCTCAT GTGAGGGATG
 GCTCATCTGA AGATGGGAAA AAACAGGTGA TTCCAAGGGT TAGGACACCA GAGTGGGATT CAAGGCCCTCT CATTTTAA
 30 ACCCTCTGAT TGGCTGGGCA CAGTGGTCTA CGCTGTAAAT CCCAGCACT TGGGAGGCTG AGGCAGGTGG ATCAGAGGT
 CAGGAGATCG AGACCATCCG GCTAACATGG TGAACCCCA TCTCTGCTAA AAAATATATA TATATAAAT TAGCCGGGCG
 TGTGTGGGAG CACCTGTAGT CCCAGGTACT CGGAGGCTG AGGCAGGAGA ATGGTGTGAA CCCAGGAGGT GGAGGTTGCA
 GTGAGCTGAG ATCAGGCCAC TGCCCTCCAG CTGGGCTAC AGAGCAAGAC TCCGCTCAA AAAATAAATA AATAAATAA
 35 AAAGACCCCT GCATCTCTTT TCTTCTACCC CTTCCCTTT TGATTACTTG TATGCCTTCT TTCAATATTC TAGTCATCTC
 TCAATATTAT TCTCCACCC TATTTTCTCT TATCTTTCT GCCTAGATT AGGTATATAT TATGTGGTCA AACAGCATAG
 CATATATGTG AACATTTCAA AGAGCTGTGT ATCTGGAATA GGATCAAAAG GTTTGACTTA AAGTTTGTCT CTGCATAATC
 CATATGGCAG GACCTGAATA TTAGGTGTGA CTCTCGTTA TGAACATAT CTGGGTACAT TTCCTTATGT CCTCTGTGT
 TACTTAAGAA CACATATTTT ATGCTTGTG CATTTTTATC ACTCTACTG CCAACAAATA GCATAGCATC CTTAGGCACA
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 ATCCAGGACC TAATGAATAA GAATCTGCAT TTTAGCAAGA CCCTCATATG ATTCATATAC ACTTTTTTTT TTTTTTTT
 60 GATGGAGTCT CACTCTTGTC GCCCAGGCTG GAGTGCAATG GCATGATCTT GGCTCACTGC AACCTCTGCC TCCCAGGTTT
 AAGTATTCT CTGTCTCAG CCTCCCTAGT AGCTGGGACT ACAGGTGCAT GCCACAGTGG CTGGCTAATT TTTGATTTT
 TAGTAGAGAC AGGGTTTCAC CATTTTGGTC AGGCTGGTCT TGAACCTATG ACCTCCGGTG ATCCCCCGC CTCGGCTTCC
 CAAAGTGCTG GGATTACAGA CATGAGCCAC CACACCCGCC TTATTCTGAT ACNCAATTA TCTGAGAAAG CACTCTATAG
 65 AAAATAAGAA TAAGAAAAATA TTGGGCTCAC AGGTGACATT AATAAGTAAC TTTATCGAGT ACCCCAAAT TTACCTATGT
 TTGGAAGATG GGGTTAAAAA GACACATTGA AAACAAGAAC TCAATTGTTG TTTTCTTCT CCTTTTGA ACAGTTTCT
 ATTTCTGAA TGTGTCAAT TATATCTGAA AGGAGAAATG CAACATATCT GGTGAGTTGC CCGTTCTGT CTTTGTCAAT
 CCTTGAAGAG ATAAGAAGAA CAGAGTTTAA AGAGTCTTAA GGGAAACACA TCTTTGTCTC CTATATTACT TGTGAATGTG
 GATATATGAT TTTGTTTCAA TCTATTTTGT GTCTTAAGGC TTTTGTGAA AGAAGTTGGA TATATCAITA GAAACATAAA
 70 TTGTACCAT TTAACATAT GAAGTTTATG TTTACTTGA CGTCTTCTA AAAAGTGTC TACACCGGCA TTGCTCTTGT
 AGGCATATTC ACATGATCAA ATAAAAAAT TAGTTTCAA TTAAGGAGAA TATTGAGGA AAGACCGTAC GTGTTCTATG
 GGTTCCTGAA GGCAGTCCAG TGAGAAAGTA ATATATGCT CATTAACAA TCGGGACATT TTCAGGGTTT CCCTTTTTAA
 CCAAAATTTG GAAGCAATGT GGAATTACT GGTGCACTC AGCCCTGAAA TGAAGATAGG TTTATTGAAT GTGCCAGCAA
 GTGCAGGCC AGGTCTGAGT GTTCTTCATT ATTATCAGG GAGAGGAAGC CTGGGAGCAA ACACCTGCCAG CAGCATAGCT
 75 GGGGGAACGG GAATTACCAT CCTGATCATC AACCTGAAAG AGAGCTTGGC CTATATCCAC ATCCACAGT GCCAGAAATT
 TTTTGAGACC AAGTGCTTTA TGGCTTCTT TTCCACTGTA TGTATTTTT TTTGTGTGGG AAGACTAAGA TTCTGGGTCC

TAATGTAAGT AAGAAGCCCT CTCTCTCTGT TCCATGAACA CCATCCCTTT CTGTAACCTC TATTACACAG TATAGTGGTT
 CTGTAAGTTC ACACAGCCCA GGGAGATGCT GGCTGCCAC TCCCCTCAAC CCAAGCAAAT TCCTCGGGGT TAAAGTTATC
 TACTGCAAGT GACGATCTCT GGGTTTTTCT GTGCTGTGT TTGTGTGTGT GTGTGTGTGT GTGTGTGTGT GTATGTGTCA
 5 CTTTAAAAGG ACTGGTCAGA TGGTAGGGAG ATGAAAACAG GAGATGCTAT AAGAAAATAA ACTTTTGGGG CGAATACCAA
 TGTGACTCTT TTGTGTTGTC ATTTGTTGCT GTTCAATAGG AAATGTAGT GATGATGCTG TTTCTACCA TTCTGGGACT
 TGGTAGTGCT GTGTCACTCA CAATCTGTGG AGCTGGGGAA GAACTCAAAG GAAACAAGGT AGATAGAAGC CCGATATAAA
 ATCTTGAATG ACAGGTTAAC GAATTGGAGC TTTATTCCTT AAAATATGGC CTGGGTTTTT TGAAACATTT CTCCAGAAA
 ATAGTTTCTC CAAGTTTTAT TACITTTGTT TACAAATCTC ACATTTAAAT CACATTTTAT ACCATAAGTA GCACACATTT
 10 CATAATATTC CTCTGAATGA GGGTTGGGAT AATAGGACTG ATATGTTAGA AATGCCCTAA AGTGTGTGGA GCATGAGAGA
 TGGATGTACA GAAGGCTTGT GAGGAAACCA CCCAGGTATC TGGCCTTGT TTCTGCCCA GAACATAGCCG CCTATTCCTG
 TTCTGTITTT ATTCCTTGT TTCTTGACTT TTCTTTCCA ACTTGCTCTA AAACCTCAGT TTTCTTTCCT TTCTGATTC
 TGAATACCAA ATGTTTTTAC TTGCCCTACC CGTCCATTAC ACCTTTGATA AGAACCACCA GACCTTGTGC TCATGTACTT
 GCCATGTCT GATGGAAGAA ACATACTCTC TCCATCTGTC CACTTTCCCT AGGCATTCAA GTCTAGCCAC CTTTTAAAT
 15 CACTCTCCTC CAGGCTGGG ACGGTGTAC GCGTGTACT TCAGCACTTT GTGAGGCTGA GGAGGGCGGA CTACTTGAAG
 TCAGGAGTTC AAAACCAGCC TGGCCAAATG GCAAAACCAA ATCTTCTTCA ATTATAACCA AATCTTAAAC CAAATCTCTA
 CTAATAAATA CAACAACAAC AAACAACAAC AAAAAACCA GAAAAAGGAA CATTAGCCCA GCGTGGTGGC AGGTACCTGA
 GGTTCAGACT ACTTGGGAGG CTGAAGCAGG AGAATCGTGT GAGCCCAAGA GATGGAGGTT GCATGAGGCC CACTATGCG
 CACTGCACCA CAGCCAGGGT GACAGAGCCA TACTTCCCAG CACATTGGGA GGCCAAAGCT GAAGAATAAT TTGAGGTGAG
 GATTTGGAGA CCAAGCTGGC CAACATGGTG AAATCCCTGT TGTACTAAAA ATATAAAAT TAGTGGGGCA TGGGGGCCA
 20 CACCTGCTAT TTCAGTACT TAGGAGGCTG AGGCAGGAGA ACTTGCTGAA CCCGGGAGG GGAAGTTGCA CTAAGCCAAAG
 ATCGTGGCCA CTGCACTCCA GCCTGGGTGA CATAGTGAGA TTCTGTCTCA AAAAAATAA AAGAAATTTA AAAATCACT
 CTCTTCCAAA GATAGATAAA TAAGACAGCA GATATACTAA GGAATAACCT CACCAACTTG TCATGTAGCT ACATGATTC
 TTTTGGCCCA CTGGCCAGC TAGTCTGGTT TGGTTTTCTG GAAATGAAAG AAATAATCAG AGTTTAATGA CAGAGCCGCT
 GAGACCCAGA AAGACAAAAG TAGATGAGGT AAGTCTCTG AGCGAGACTT CTAGGGATGG GAAATTTGTG GTGATTGATA
 25 TGAATGATTT TTCCCTTAT CAGGTTCCAG AGGATCGTGT TTATGAAGAA TTAACATAT ATTCACTAC TTACAGTGA
 TTGGAAGACC CAGGGGAAAT GTCTCTCTCC ATTGATTTAT AAGAATCAGG TGTCCAGAAC ACTCTGATTC ACAGCCAAGG
 ATCCAGAAAG CCAAGGTTTT GTTAAAGGGC TACTGGAAAA ATTCTATTCT TCTCCACAGC CTCTGGTGT TACATTAGAT
 TTATTCGCTC GATAAGAATA TTTTGTCTCT GCTGCTCTG TCCACCTTAA TATGCTCCTT CTATTTGTAG ATATGTAGATA
 CTCCTATTTT TCTTGTTTA TATTATGACC ACACACATCT CTGCTGGAAA GTCAACATGT AGTAAGCAAG ATTTAATGT
 30 TTGATATAA CTGTGCAAAAT ACAGAAAAAA AGAAGGCTGG CTGAAAGTTG AGTTAACTT TGACAGTTTG ATAATATTG
 GTTCTTAGGG TTTTTTTTT TTTTAGCATT CTAAATAGTT ACAGTTGGGC ATGATTGTGA CCATCCACCC ATACCCACAC
 AGTCACAGTC ACACACACAT ATGTATTACT TACACTATAT ATAACCTTCT ATGCAAAAT TTTACCACCA GTCAATAATA
 CTGTTTGGC AAGACATGAA GTTTTATAAA GATCTGTATA ATTGCTGAA TCACCCAGC ATTCAGTGAC ATGATATTAT
 35 TTGCAGATTG ACAAGTAGGA AGTGGGGAAC TTTTATTAAG TTACTCGTGT TCTGGGGAGG TAAATAGGTT AAAACACAGG
 AAATATAAAG TGCAGAGATT AACATTTCAC AAATGTTTAG TGAACAATTT GTGAAAAAAG AAGACTAAAT TAAGACCTGA
 GCTGAAATAA AGTGACGTGG AAATGGAAAT AATGTTTATA TCTAAACAT TCTAAAAAG AGTAACTGGT AGATTGTGT
 AACAATAAAG AGAATAAAGT TAGACAAGCA ACTGGTTGAC TAATACATTA AGCGTTTGAG TCTAAGATGA AAGGAGAACA
 CTGGTTATGT TGATAGAATG ATAAAAAGG TCGGGCGCGG AGGCTCAGC CTGTAATCCC AGCCCTTTGG GAGGCGGAGG
 40 TGGGAGATC ACGAAGTCAG TAGTTTGAGA CCAAGCTGGC CAACATAGTG AAACCCCGTC TACTATAAAA ATACAAAAAA
 AAAATTAGCT GGGTGTGTGT GCAGTCACCT GTAGTCCAG CTACTTGGGA GGATGAGGCA GGAGAATCGC TTGAACCTGG
 GAGGCGGAGG TTGCAGTGAG CCGAGATCGC ACCAGTGCAC TCCAGCCTTG GTGACAATGG GAGACTCCAT CTCAAAAAA
 AAAAAAATAA AAAAAAGATA AAAAGTCAGA AATCTGAAAA GTGGAGGAAG AGTACAAAAA GACCTAAATT AAGTCTCAT
 TTTTGGCTTT GATTITGGGG AGACAAAGGG AAATGCAGCC ATAGAGGGCC TGATGACATC CAATACATGA GTTCTGTAA
 45 AGATAAAATT TGATACACGG TTTGGTGTC TTAAGAAGA AATCATTATT AAATGAAGCA AGTTAACACT CTAAGAGAA
 TATTTTGAGA TAGAAGTGAA GCTAAGCTAA ACTTCACATG CCTATAATTG GAGGGAATAA CTAAGGATAA AATCTAGCCT
 AGAAGATACA ATAATTAGTC ATAAACATGC ATTGTGAAGC TGTAGAGAGC AGGTAGCCCA AAATAGAGAA AGATTAGATA
 AAGAGAAAT AAGTATCCAT CAGAGACAGT ATCTCTAGCG TTGGGCAAGA GAAAAAGTCCA CAGTGATAAG CAACTCCACC
 TAAGTATGCA ATATGCGCA GAGAAAAACG CAATAGTGA AAATGCAAAA AGGTGCTGAG CAAATTCAC ATAGATATG
 50 TGTGCATGAG TAAATGAATA AAACATTTGC AAAGACCTTT AGAGAAAGAG AATGGGAGCA TATGTGCGAA ATAAGATAGT
 TGATTATGAA TAGAAGGTAG TGAAGAAAAG CAAGCTAAGA AAAAAATCTG TTTATAAAG AAGGAAAAAG TAGTTTATGT
 TTTTAGCCTA AGTATAAGAG TCCTACAGAT GGACTGAAAA AAATCAGTCT GAGAGTATTA GTCAAAATTA ATGAAATAAT
 TACATTTTAT GTATTGAGGA TGCCAAGATT AAAAGGTGAC AGGTAGATGT TAATTTCCCT AGATTGTGAA AGTGATCAG
 ACAATCACAC AACAATAAT TAAGTGACTT GGTATGCTTT ATTTAATTGT AGGGCCTGAG GTTTTCCATT CTCATTTTTC
 55 TAAAAACAA TTTTGTCTT CCAATTTTGA CAGCAGATA AAAACCCCTAC CCTTTCACTG TGTATCATGC TAAGCTGCAT
 CTCTACTCTT GATCATCTGT AGGTATTAAT CACATCACTT CCATGGCATG GATGTTTACA TACAGACTCT TAACCCTGGT
 TTACCAGGAC CTCTAGGAGT GGATCCAATC TATATCTTTA CAGTTGTATA GTATATGATA TCTCTTTTAT TTCCTCAAT
 TTATATTTTC ATCAITGACT ACATATTTCT TATACACAAC ACACAATTTA TGAATTTTTT CTCAAGATCA TCTGAGAGT
 TGCCCAACCC TACCTGCCTT TTATAGTACG CCCACCTCAG GCAGACACAG AGCACAATGC TGGGGTCTC TTCACACTAT
 60 CACTGCCCA AATTGTCTTT CTAATTTTCA ACTTCAATGT CATCTTCTCC ATGAAGACCA CTGAATGAAC ACCTTTTCAT
 CCAGCCTTAA TTCTTGTCTC CATAACTACT CTATCCCATG ATGCAGTATT GTATCAITTA TTATTAGTGT GCTTGTGACC
 TCCITATGTA TTCTCAATTA CCTGTATTG TGCAATAAAT TGAATAAAT TAACITGATT TCTTATCTGT GTTTGTGTG
 GCATGCAAGA TTTAGGTACT TATCAAGATA ATGGGGAATT AAGGCATCAA TAAAAATGAT CCAAAGACCA AGAGCAGITT
 CTGAAGTCTC CTTTTCATC AGCTCTTAT CAAACAGAAC ACTCTATAA CAACCCATAG CCAGAAAAA GATGTAGGA
 65 ACAATACCA GCACACTCTA TAAACAACCC ATAGCCAGAA AACAGAATGT AAGGACAATC ACCAGCCATC TTTTGTCAAT
 AATTGATGGA ATAGAGTTGA AAGGAACCTG AGCATGAGT ATATTGACC AGTCAGTCT CACTCTTATT TACTTGCTAT
 GTAAACTTGA GAAAGCTTTT TTCTCTTTG GAACCTCAGG TTTTACATCT GAAAAATGAGA AATTGGAAC AAAAGATTCC
 TAACTGGTCT TTCTGTCTCC ATATTCTGTG ATTTTCAAT ATTTAGGATT TTTGGAATC ACAATTACTT AGTTTGTGTG
 TGAGATAGCA ACACGAATCA GAACTATTTG GTGGACATAT TTCAAAGGA GTAGCTCTCC ACTTTGGGTA AAGAAAGTAT
 70 GCNGTCTGT GTGGCTCAGC CCTGTAATCC CAGCATTTTA GGGAGGCCAA GCGGGGTGGA TCACAGGCTC AGGAGATCGA
 GACCATCTGT GCTAACACGG TGAACCCCG TCTCTACTAA AAAATACAAA AAATTAGCCA GCGGTGTGTG CGGGCGCTG
 TAGTCCACAG TACTCGGGAG GCTGAGGCAG GAGAATGGCA TGAACCCAGG AGGCGGAGCT TGCCGTGAGC CGAGATAGCG
 CCACCTGAGT CCTCTCTGG CAAAGAGCA AGACTCGCT TCAAAAAAAA AAAAAAATAA AAAAAAATAA GTGTGTGAG
 TAGCAGGACA CCTGCAACAA TAATATTTT CTAAATCCCT CTGAAAAATG CTAATCAAAG GGTTTTTTTC CTAATAATTG
 TCTTAGAAAT AAAATTTCCC CTTTGGGAGA CCGAGGCTGG CAGATCAGCA GGTCAAGGAGA TAGAGACCAC GGTGAAACCC

CGTCTCTACT AAAAATACTA AAAATTAGCC GGGGNGTGGT GGTGGGTACA CCTGTAGTCC CAGCTACTTG GAGGCTGAGG
CTGGAGAATC ACGTGAAC-3' (FRAG. NO: 11873) (SEQ ID NO: 11873)

Human Histidine Decarboxylase Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-TCT CCC TTG GGC TCT GGC TCC TTC TC TCT CTC TCC CTC TCT CTC TGT CGC CTC CGC CCT GGC TGC TGG GGT GGT
GGT GC TTT TGT TCT TCC TTG CTG CC GCC CCG CTG CTT GTC T TC CTC G CTC TGT CCC TCT CTC TCT GTB CTC CTC BGG
CTC CBT CBT CTC CCT TGG GC-3' (FRAG. NO: 1700) (SEQ ID NO: 11082)
5'-GGC TCT GGC (FRAG. NO: 1701) (SEQ ID NO: 11083)
5'-CCC TTG G (FRAG. NO: 1702) (SEQ ID NO: 11084)
5'-TT TGT TCT TCC (FRAG. NO: 1703) (SEQ ID NO: 11085)
10 5'-TCT CCC TTG GGC TCT GGC TCC TTC TC-3' (FRAG. NO: 1024) (SEQ ID NO: 10403)
5'-TCT CTC TCC CTC TCT CTC TGT-3' (FRAG. NO: 1025) (SEQ ID NO: 10404)
5'-CGC CTC CGC CCT GGC TGC TGG GGT GGT GGT GC-3' (FRAG. NO: 1026) (SEQ ID NO: 10405)
5'-TTT TGT TCT TCC TTG CTG CC-3' (FRAG. NO: 1027) (SEQ ID NO: 10406)
5'-GCC CCG CTG CTT GTC T TC CTC G-3' (FRAG. NO: 1028) (SEQ ID NO: 10407)
15 5'-CTC TGT CCC TCT CTC TCT GTB CTC CTC BGG CTC CBT CBT CTC CCT TGG GC (FRAG. NO: 1029) (SEQ ID NO: 10408)

Human Beta Tryptase Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-CTT GCT CCT GGG GGC CTC CTG GTC CCT CCG GGT GTT CCC GGC GGG CCT GGC CTG GGG CBG GGG CCG CGT BGG CGC
GGC TCG CCB GGB CGG GCB GCG CCB GCB GBT TCB GCB TCC TGG-3' (FRAG. NO: 1704) (SEQ ID NO: 11086)
5'-GCT CCT GGG GGC CT-3' (FRAG. NO: 1705) (SEQ ID NO: 11087)
20 5'-CGT BGG CGC-3' (FRAG. NO: 1706) (SEQ ID NO: 11088)
5'-T GGC CTG GGG-3' (FRAG. NO: 1707) (SEQ ID NO: 11089)
5'-CTT GCT CCT GGG GGC CTC CTG-3' (FRAG. NO: 1030) (SEQ ID NO: 10409)
5'-GTC CCT CCG GGT GTT CCC GGC-3' (FRAG. NO: 1031) (SEQ ID NO: 10410)
5'-GGG CCT GGC CTG GGG CBG GGG CCG CGT BGG CGC GGC TCG CCB GGB CGG GCB GCG CCB GCB GCB GBT TCB GCB
25 TCC TGG-3' (FRAG. NO: 1032) (SEQ ID NO: 10411)

Human Tryptase-I Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-CTT GCT CCT GGG GGC CTC CTG GTC CCT CTG GCT G TT CCC GGC CCT GGB CTG GGG CBG GGG CCG CGT BGG CGC GGC
TCG CCB GGB CGG GCB GCG CCB GCB GCB GGC TCC TGG CCB CGG BBT TCC-3' (FRAG. NO: 1708) (SEQ ID
NO: 11090)
30 5'-CT CCT GGG GGC CTC CTG-3' (FRAG. NO: 1709) (SEQ ID NO: 11091)
5'-B TCC TGG CCB CGG BBT TCC-3' (FRAG. NO: 1710) (SEQ ID NO: 11092)
5'-GTC CCT C-3' (FRAG. NO: 1711) (SEQ ID NO: 11093)
5'-CTT GCT CCT GGG GGC CTC CTG-3' (FRAG. NO: 1033) (SEQ ID NO: 10412)
5'-GTC CCT CTG GCT G TT CCC GGC-3' (FRAG. NO: 1034) (SEQ ID NO: 10413)
35 5'-CCT GGB CTG GGG CBG GGG CCG CGT BGG CGC GGC TCG CCB GGB CGG GCB GCG CCB GCB GCB GCB GGC TCB GCB TCC
TGG CCB CGG BBT TCC-3' (FRAG. NO: 1035) (SEQ ID NO: 10414)

Human Prostaglandin D Synthase Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-GGT GTG CGG GGC CTG GTG CC CCT GGG CCT CGG GTG CTG CCT GT GCG CTG CCT TCT TCT CCT GG GTC CTC GCC GGG
GCC CTT GCT GCC CTG GCT GT GCC CTG GGG GTC TGG GTT CGG CTG T CCC CBG CBG GBC CBG TCC CBT CCB CBG CGT
40 GTG BTG BGT BGC CBT TCT CCT GCB GCC GBG-3' (FRAG. NO: 1712) (SEQ ID NO: 11094)
5'-T TCT CCT GCB GCC GBG-3' (FRAG. NO: 1713) (SEQ ID NO: 11095)
5'-CTT GCT GCC CTG GCT GT-3' (FRAG. NO: 1714) (SEQ ID NO: 11096)
5'-TCT TCT CCT GG-3' (FRAG. NO: 1715) (SEQ ID NO: 11097)
5'-GGT GTG CGG GGC CTG GTG CC-3' (FRAG. NO: 1036) (SEQ ID NO: 10415)
45 5'-CCT GGG CCT CGG GTG CTG CCT GT-3' (FRAG. NO: 1037) (SEQ ID NO: 10416)
5'-GCG CTG CCT TCT TCT CCT GG-3' (FRAG. NO: 1038) (SEQ ID NO: 10417)
5'-GTC CTC GCC GGG GCC CTT GCT GCC CTG GCT GT-3' (FRAG. NO: 1039) (SEQ ID NO: 10418)
5'-GCC CTG GGG GTC TGG GTT CGG CTG T-3' (FRAG. NO: 1040) (SEQ ID NO: 10419)
5'-CCC CBG CBG GBC CBG TCC CBT CBG CGT GTG BTG BGT BGC CBT TCT CCT GCB GCC GBG-3'
50 (FRAG. NO: 1041) (SEQ ID NO: 10420)

Human Cyclooxygenase-2 Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-GGG CGC GGG GCB GCB TCG C TTT GGG CTT TTC TCC TTT GGT T TGB GCG CCB GGB CCG CGC BCB GCB GCB GGG CGC
GGG CGB GCB TCG CBG CGG CGG GCB GGG-3' (FRAG. NO: 1716) (SEQ ID NO: 11098)
5'-G GCB GGG-3' (FRAG. NO: 1717) (SEQ ID NO: 11099)
55 5'-TCC TTT GGT T-3' (FRAG. NO: 1718) (SEQ ID NO: 11100)
5'-GGG CGC GGG GCB GCB TCG C-3' (FRAG. NO: 1042) (SEQ ID NO: 10421)
5'-TTT GGG CTT TTC TCC TTT GGT T-3' (FRAG. NO: 1043) (SEQ ID NO: 10422)
5'-TGB GCG CCB GGB CCG CGC BCB GCB GCB GGG CGC GGG CGB GCB TCG CBG CGG CGG GCB GGG-3'
(FRAG. NO: 1044) (SEQ ID NO: 10423)

Human Eosinophil Cationic Protein Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-CCT CCT TCC TGG TCT GTC TGC CBG BCB BBT TTG GGB BGT GBB CBG TTT TGG BBC CBT GTT TCC CBG TCT CTG BGC
TGT GGC-3' (FRAG. NO: 1719) (SEQ ID NO: 11101)
5'-TTC TCC TTT GGT T-3' (FRAG. NO: 1720) (SEQ ID NO: 11102)
5'-T TTC TCC TTT GGT T-3' (FRAG. NO: 1721) (SEQ ID NO: 11103)
65 5'-GGG CGC GGG GCB GCB TCG C-3' (FRAG. NO: 1042) (SEQ ID NO: 10421)
5'-TTT GGG CTT TTC TCC TTT GGT T-3' (FRAG. NO: 1043) (SEQ ID NO: 10422)
5'-TGB GCG CCB GGB CCG CGC BCB GCB GCB GGG CGC GGG CGB GCB TCG CBG CGG CGG GCB GGG-3'
(FRAG. NO: 1044) (SEQ ID NO: 10423)

Human Eosinophil Derived Neurotoxin Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-GCC CTG CTG CTC TTT CTG CT TCC CTT GGT GGG TTG GGC C GCT GGT TGT TCT GGG GTT C TTG CTG CCC CTT CTG TCC C
TGT TTG CTG GTG TCT GCG C 5'-CCC CBB CBG BBG BBG CBG BCB BBT TTG GGB BGT GBB CBG TTT TGG BBC CBT GTT TCC
TGT-3' (FRAG. NO: 1722) (SEQ ID NO: 11104)
5'-TTC CTG T-3' (FRAG. NO: 1723) (SEQ ID NO: 11105)

- 5'-CTC TTT CTG CT-3' (FRAG. NO: 1724) (SEQ ID NO:11106)
 5'-CCC CTT CTG TCC C-3' (FRAG. NO:1725) (SEQ ID NO:11107)
 5'-GCC CTG CTG CTC TTT CTG CT-3' (FRAG. NO:1047) (SEQ ID NO:10424)
 5'-TCC CTT GGT GGG TTG GGC C-3' (FRAG. NO:1048) (SEQ ID NO:10425)
 5'-GCT GGT TGT TCT GGG GTT C-3' (FRAG. NO:1049) (SEQ ID NO:10427)
 5'-TTG CTG CCC CTT CTG TCC C-3' (FRAG. NO:1050) (SEQ ID NO:10426)
 5'-TGT TTG CTG GTG TCT GCG C-3' (FRAG. NO:1051) (SEQ ID NO:10428)
 5'-CCC CBB CBG BBG BBG CBG BCB BBT TTG GGB BGT GBB CBG TTT TGG BBC CBT GTT TCC TGT-3' (FRAG. NO:1052) (SEQ ID NO:10429)
- 10 **Human Eosinophil Peroxidase Nucleic Acid and Antisense Oligonucleotide Fragments**
 5'-GCG CTC GGC CTG GTC CCG G GGG TCT CCT CTT GTT GTT GC TTG CGC CTC CTG CTG GGG GT CC CTC TGT TCT TGT TTT
 GGG GGC GGG CCC GGC CGT TGT CTT G GTT TGG GGG TTT CCG TTG GGG TTC TCC TGG CCC GGG CCT TGC CC GGC CGT
 GGT OCC GGC TTC GTTCCT GTC TCC GTC TCG GCT CTT CTG GGG CCT TGC GCT GTC TTT GGT G 5'-GCB CCG TCC BGT GBT
 GGT GCG GTB CTT GTC GCT GCB GCG CTC GGC CTG GTC CCG GGB BGC CACCGCTCCT GTCAGCCAAC AAATATCCAT
 15 TAGCGCACAC CTGTGTCCCA GGTGCTGCTC TGGGCCCTGG GAGAAGTGCA TCAGTGGGCT TGGTAGTGA GGTAGGGAT
 GGAGTGAAGG GTAGGCAGGA AGAATGTCCC CAGGCTGTGA GGAGGTGGGG TGGGGGGTTT CAGTCTCAAA ACTCCCATGA
 AAACCAAGAGA GAAGTTTCAG AACTCCACCC AAGAGGCTGG GTTTCTAGGG CCCAGAGCTG CCTCCCCCA CCTAGAATG
 GGCTATAAAA GTCCCTTCCC AGCTACGTCC AGAGAAGAGC TGGAGGAAAT GAGAGGTCCG CTGGGGGTCC TCAAGGTGAG
 AGGGGAGCAG AGGATCCTCC CGTGCAGGCT GTGGATGTCA CTCATTCCC AGCTGGTGAA GCCTCGCTGC AGAGATGCAT
 20 CTGCTCCAG CCCTGGCAGG GTCTCTGGCC AACTCGTCC TCGCCAGGCC CTGTGAGGGC ACTGACCCAG GTAATAGTCC
 CCTAGACAGG CAAGGAGGAG GGAGGGGAAA TGGAAAGGGA AGCACTTGGG TCTTGGAGGG GGTCTTGTGG CTGTGTAAC
 CCTGAGTCCC CATCTCTTG AACAGCCTCC CTGGGGCAG TGGAGACCTC GGTCTGCGA GACTGCATAG CAGAGGCCAA
 GTTGTCTGTG GATGCTGCCT ACAATTGGAC CCAGAAGAGG TGGACTTGGG TCTGGGGCT GCATGGGCTT GGGAGGATCA GT
 TAATACCTTG TGGGTCAGG GAGCCCATGT CCGTGTCTGA TGTATTTC CCACCAAGTC CGGGCTGTCT CCAACAGGAT
 25 TGTGCGCTTC CCAATGAGA GACTGACCTC CGACCGTGGC CGAGCCCTCA TGTTCATGCA GTGGGGCCAG TTCATTGACC
 ATGACCTGGA CTCTCCCGG GAGTCCCGG CCAGAGTGGC CTTCAGTCA GCGGTGACT GTGAGAGGAC CTGCGCCGAG
 CTGCCCCCT GCTTCTCCAT CAAGGTACCT ACCCTCAGCC AATCTCCAT GCCCTTGTGT GGCCTCCGCC AAAGGCAAGG
 TGCTGGGGGT GGGGATCTGG AAGACTGGAG CACCATCCTT AAGGAGCTGC CTGTGGAGCT AGGGTATGAG ACAGAGACAC
 AAG CACTGTCTCC TCTTCCATCT CAGATCCAC CCAATGACC CCGCATCAAG AACCAGCGTG ACTGCATCCC TTCTTCCCG
 30 TCGGCACCT CATGCCCA AAACAAGAAC AGAGTCCGCA ACCAGATCAA CGCGCTCACC TCCTTTGTGG ACGCCAGAT
 GGTGTATGCC AGTGAGGTCT CCCTCTCGCT GCGGCTCCG AACCAGGACA ACTACCTGGG GCTGCTGGCC ATCAACAGC
 GCTTTACGA CAACGGCGG GCGCTGCTGC CTTTCAGCAA CCGTGCAGAT GACCCCTGTC TCCTACCAA CCGCTCGGCG
 CGCATCCCT GCTTCTGGC AGGTACAGCA GGGAGGAAAG TGGTGTCTT CCAGGAAACA GCCATCCCT GGGTCCCAAC
 TGGGAAGCAA TGGTGGGATG TGGTGAAGGT ACATGGTTTG GGACCTCAGT ATTAGGCACA CCATAAGCAT GGATCTGTGC AC
 35 TGAAGAGATG GAGGTCCAGT GAGGGCCAGG AGTTTGGCCC ACCCGTCTC TCCCATCCCC AGCCCTGGGT CTACCCCTGGT
 AGAAGACAT TTTCTGGGA AAGGCTGAG TAAATCTGAG CTTGGGGTTT TCAAGGTGAC ACCCGATGAG CCGAAGACCC
 CAACTGGCA GCCATGCACA CCCTCTTTAT GCGAGAGCAC AACCGGCTGG CCACCGAGCT GAGACGCTG AATCCCCGGT
 GGAATGGAGA CAAACTGTAC AATGAGGCTC GGAAGATCAT GGGGGCCATG GTCCAGGTAA GGAGCTCTGC ATCCAGCAT
 CCCC CTITGTATCT CCACCCCA ATAGTAAT AATGTGTGTA CATTGACGT GATGACAATA AAGAATATGT
 40 CTGAGCCACC CTTTGAAGG GCAAGGGTAT GGTGAGTAG CCTCTGGGA ATGTTCCTCC TGCTTCCCT TCCAGATCAT
 CACCTACCGA GACTTTCTGC CCCTGGTTCT GGGCAAGGCC CCGGCCAGGA GAACCTGGG GCATACAGG GGGTACTGCT
 CCAATGTGA GCCACGGGTG GCCAATGTCT TCACCTGGC TTTCCGCTT GGCCACACAA TGCTCCAGC CTTATGTCT
 CGCTTGACA GTCAGTACG GGCCTCCGA CCAACTCGC ATGTCCCACT TAGCTCTGCC TTCTTTGCA GCTGGCGGAT
 CGTGTATGA GGTGACCAGG TTTTCCAGG GGCATAAGG GGTGAGGGT GGGAGCATG CCTCCCTAG GTGG
 45 TCCAGCTGT TCACTGTCT CCAGAATCT GTTCTCTGAG AAGCTTACT AACATACCCG ACTGGTGTG CTAGCTCTGG
 GCTAGCTTG CATCATGTGA TAACCAAGT AGCTTCCAG AGGCTGGTCC AATCTGTGCT GCTCACATTC CTGCCACCA
 GGGGGCATCG ACCCATCTCT CCGGGGCTC ATGGCCACCC CTGCCAAGT GAACCGTCAG GATGCCATGT TAGTGGATGA
 GCTCGGGAG CGGCTGTTT GGAAGTGA GAGGATGAG CTGGAGCTGC CAGCTCTCAA CATGCAACA AGCGGGACC
 ACGGCTTCC AGGTGAGGGG GCTGTCCACC TCTTCTCCA GCTTGTCTG GCGCAGGCTG CTCAAGGGGT TCTGGGAAGA
 50 CCGTGTCTT CGACTCGCTG GTAGGTTCTG GTGGCAGAAA CAGAGGTGTT TCAACAAAAG ACAGCGCAAG GCCTGTAGCA
 GAAITTTCTT GTCTCGAATT ATATGTGACA ATACCGTAT CACCAAGGTT TCAAGGGACA TCTTCAGAG CACATCTAC
 CCTCGGGCT TTGTGAAGT CAGCCGTATC CCCAGGTTGA ACCTATCAGC CTGGCGAGGG ACATGAGGCT TCTGCAGTA
 AGGGGAGGCC ACCTCCAGCA CCCTGGGCTG GTTAAGCCTC ACATCTTCC CTGGATGGAT GGTGAGTCC TCTTAGGTCT
 CTAAGCAGAG AAAACAGAAC TTGTCACTAG GTACTTCTT CAAGTGGCTT CCAATGTGC TAGTTTCTG GCTGACAGTC
 55 AATTCCAGGC CTAGGACTT TGGGGGAAA TTAGGAGCAT CCAACTA GAATTCCTG GCCAGGACCC CTGCCAGGGC
 ACTGACCCAG CCTCCCTGG GGCAGTGGAG ACCTCGGTCC TGCGAGACTG CATAGCAGAG GCCAAGTTC TGGTGGATGC
 TGCCTACAAT TGGACCCAGA AGAGCATCAA GCAGCGGCTT CGCAGCGGTT CAGCCAGCCC CATGGAACCT CTGCTACT
 TCAACAACCC GGTAGCAGCC ACCAGGACAG TTGTTCGGGC CGCAGATTAT ATGCATGTGG CTTTGGGGCT GCTTGAAGAG
 AAGTTACAAC CCCACGGTC CGGACCTTC ATTGTCACTG ATGTGCTAAC AGAACCACAG CTGCGGCTGC TGTCCAGGC
 60 CAGTGGCTGT GCTCTCCGG ACCAGGCCGA CGCTCTCAGC GACAAGTACC GCACCATCAC TGGACGGTGC AACAACAAGA
 GGAGACCTT GCTAGGGGCC TCCAACAGG CTCTGGCTCG CTGGCTGCC GCGGAGTATG AGGATGGGCT GTCGCTCCCC
 TTCGGCTGGA CCCCCAGCA GAGGCGCAAT GGCTTCTTTC TCCTCTTGT CCGGGCTGTC TCCAACAGA TTGTGCGCTT
 CCCCATGAG AGACTGACCT CCGACCGTGG CCGAGCCCTC AGTTTCATGC AGTGGGGCCA GTTCTATGAC CATGACCTGG
 ACTTCTCCC GGAGTCCCCG GCCAGAGTGG CTTTCACTGC AGGCGTTGAC TGTGAGAGGA CCTGCGCCCA GCTGCCCCCC
 65 TGCTTTCCA TCAAGATCCC ACCCAATGAC CCCCAGTCA AGAACCAGCG TGAATGCATC CCTTCTTCC GCTCGGCCAC
 CTCATGCCCC CAAAACAAGA ACAGAGTCCG CAACAGATC AACCGCTCA CCTCTTTGT GCACGCCAG ATGGTGTATG
 GCAGTGGCT CTCCCTCTCG CTGCGGCTCC GCAACCGGTC CAACACTGG GGGCTGCTGG CCATCAACCA CGCTTTCAA
 GACAACGGCC GGGCCCTGCT GGCCTTCGAC AACCTGCACG ATGACCCCTG TCTCCTACC AACCGCTCG CGCGCATCCC
 CTGCTTCTG GCAGGTGACA CCGATCAAC GGAACCCCTC AACTGGCAG CCATGCACAC CCTCTTTATG CGAGAGCACA
 70 ACCGGCTGGC CACCGAGCTG AGACGCTGA ATCCCCGTG GAATGGAGAG AAACGTGACA ATGAGGCTCG GAAGATCATG
 GGGGCCATGG TCAGATCAT CACCTACCGA GACTTCTG CCGTGGTCT GGGCAAGGCC CCGGCCAGGA GAACCTGGG
 GCACTACAGG GGTACTGCT CCAATGTGA CCCAGGGT GGCATGTCT TCACCTGGC CTTCCGCTT GGCACACAA
 TGTCCAGCC GTTATGTT CGCTTGGACA GTCACTACG GGCCTCGCA CCAACTCGC ATGCTCTGCC CTGCTTGC
 75 TTCTTGGCA GCTGGCGAT CGTGTATGA GGGGCACTG ACCCATCCT CCGGGGCTC ATGGCCACCC CTGCCAAGCT
 GAACCGTCAG GATGCCATGT TAGTGGATGA GCTCCGGGAC CGGCTGTTTC GGCAAGTGA GAGGATTGG CTGGACCTGG

CAGCTCTCAA CATGCAACGA AGCCGGGACC ACGGCCTTCC AGGGTACAAT GCTTGGAGGC GCTTCTGTGG GCTCTCCAG
 CCCCAGGAATT TGGCACAGCT TAGCCGGGTG CTGAAAAACC AGGACTTGGC AAGGAAGTTC CTGAATTGTG ATGGAACACC
 TGACAACATT GACATCTGGA TTGGGGCCAT CGCTGAGCCT CTTTGGCCGG GGGCTCGAGT GGGGCTCTT CTGGCTTGTC
 5 TGTTCGAGAA CCAGTTCAGA AGAGCCGAGA CGGAGACAGG TTCTGGTGGC AGAACGAGGT GTTTTCACCA AAGACAGCGC
 AAGGCCCTGA GCAGAATTTC CTGTCTCGA ATTATATGTG ACAATAACCGG TATCACCACG GTTTCGAAGG ACATCTTCAG
 AGCCAACATC TACCTCGGG GCTTTGTGAA CTGCAGCCGT ATCCCGAGGT TGAACCTATC AGCCTGGCGA GGGACATGAG
 GCTTCTGCAG GAGTCTATCC CAAGTCTCCA ACTTTTGGAG ACAAGGGGAA GGGGAGGACC ATGAGGCTGC CTGTCTCC
 TGGAGCAAGT GCAGGCTCGT GACGCTTCTG CTGGCTACAG CTCAGAGCTG GGTTCGCCAG CCAGGAGTGA AGGCTGGGGG
 CTCCTATCAG CAATGGACCT TCCGCTTGG GAGCCTCTTA GGTATTAGGC TATGAATCAG CGCCACGTGC AAAGGCTTGG
 10 GAGCCAAGCC ATGTGGTCTT GCACCCAGG CAAGAAAAGT CAGCTGGAGG GTTTACAGCA CTTTCTACTG TTTCCAGCC
 CTCCTCCCC TCCTCACCA TGAATAAGAC ACCACTCGT CTAGCCTCC AGACACCCCA CAATACTCCT CTGAGCCTGA
 GGCCAGGCGA CATGCTCTGC TTCTACCAAT AAAGCACTGC CGGAATTC-3' (FRAG. NO: 1726) (SEQ ID NO:12377)
 5'-CACCGCTCTT GTGAGCAAC AAATATCCAT TGAGCGACAC CTGTGTCCCA GGTGTCTGCT TGGGCCCTGG GAGAAGTGCA
 TCAGTGGGTG TGGTAGTAGA GGGTAGGGAT GAGTGAAAGG GTAGGCAGGA AGAATGTCCC CAGGCTGGTA GGAGGTGGGG
 15 TGGGGGGTTT CAGTCTCAAA ACTCCCATGA AAACCAGAGA GAAGTTTCAG AACTCCACCC AAGAGGCTGG GTTCTAGGG
 CCCAGAGCTG CCTCCCCCA CCCTAGAATG GGTATAAAAT GTCCCTTCCC AGCTACGTCC AGAGAAGAGC TGGAGGAAGT
 GAGAGGTCCG CTGGGGGTCC TCAAAGTGAG AGGGGAGCAG AGGATCTCTC CGTGCAAGGT GTGGATGTCA CTCACTCCC
 AGCTGGTGAA GCCTCGCTGC AGAGATGCAT CTGCTCCAG CCCTGGCAGG GGTCTTGCC ACACCTCGTC TCGCCAGCC
 CTGTGAGGGC ACTGACCAG GTAATAGTCC CTTAGACAGG CAAGGAGGAG GGAGGGGAAA TGGAAAGGGA AGCATTGGG
 20 TCTTGGAGGG GCTCTGTGG CTGTCTGAAC CTTGAGTCCC CATCTCTTTG AACAGCCTCC CTGGGGCAG CTGAGACCTC
 GGTCTGCGA GACTGCATAG CAGAGGCCAA GTTGTGGTG GATGCTGCT ACAATTGGAC CCAGAAGAGG TGGACTTGG
 TCTGGGGGCT GCATGGGCT GGGAGGATCA GT-3' (FRAG. NO:) (SEQ ID NO:11852)
 5'-TAATACCTTG TGGGTCAAG GAGCCATGT CCCGTGCTGA TGTATTTC CCACAGGTC CGGGCTGTCT CCAACCAGAT
 25 TGTGCGCTTC CCAATGAGA GACTGACCTC CGACCTGGC CGAGCCCTCA TGTTCATGCA GTGGGGCCAG TTCATTGACC
 ATGACCTGGA CTCTCCCCG GAGTCCCCG CAGAGGTGTC CTTTCTGCA GGGCTTACT GTGAGAGGAC CTGCCCCAG
 CTGCCCTCT GCTTCTCCAT CAAGGTACCT ACCCTCAGC AATCTCCAT GGCCTTGTGT GGCCTCCCC AAAGGCAAGG
 TGCTGGGGT GGGGATCTGG AAGACTGGAG CACCATCTT AAGGAGCTGC CTGTGGAGCT AGGGTATGAG ACAGAGACAC
 AAG-3' (FRAG. NO:) (SEQ ID NO:11853)
 5'-CACTGTCTC TCTTCCATCT CAGATCCAC CCAATGACCC CCGCATCAAG AACCAGCGTG ACTGCATCCC TTCTTCCGC
 30 TCGGCACCT CATGCCCA AAACAAGAAC AGAGTCCGA ACCAGATCAA CGCGCTCACC TCCTTTGTGG ACGCCAGCAT
 GGTGTATGGC AGTAGGCTCT CCCTCTCGCT GCGGCTCCG AACCCGACCA ACTACCTGGG GCTGCTGGC ATCAACAGC
 GCTTTCAAGA CAACGGCCG GCGCTGCTG CTTTCGACA CTTGCACGAT GACCCCTGTC TCCTACCAA CCGCTGGCG
 CGCATCCCT GCTTCTGGC AGGTGAGACA GGGAGGAAG TGGTGTCTT CCAGGAAACA GCCATCCCTG GGGTCCCAAC
 TGGGAAGCAA TGGTGGGATG TGGTGAAGGT ACATGGTTTG GGACCTCAGT ATTAGGCACA CCATAAGCAT GGATCTGTGC AC-3'
 35 (FRAG. NO:) (SEQ ID NO:11854)
 5'-TGAAGAGATG GAGGTCCAGT GAGGGCCAGG AGTTTGGCCC ACCCGTCTC TCCATCCCC AGCCCTGGGT CTACCTGGT
 AGAAAGACAT TTCTCTGGGA AAGGCTGCAG TAAATCTGAG CTGGGGTTT TCAAGGTGAC ACCCGATCAA CGGAAACCCC
 CAAACTGGCA GCCATGCACA CCTCTTTAT CGAGAGACAC AACCGGCTGG CCACCGAGCT GAGACGCTG ATCCCCGGT
 GGAATGGAGA CAACTGTAC AATGAGGCTC GGAAGATCAT GGGGGCCATG GTCCAGGTAA GGAGCTCTGC ATCCAGCAT
 40 CCCCC-3' (FRAG. NO:) (SEQ ID NO:11855)
 5'-CTTTGTATCT CCACCCACA ATAGTAAAT AATGTGTGCA CATTGACGT GATGACAATA AAGAATATGT CTGAGCCACC
 CTTTGAAAG GCAAGGGTAT GGGTGAGTAG CCTCTGGGA ATGTTCTCTC TGTCTTCCCT TCAGATCAT CACCTACCGA
 GACTTCTGC CCTGTTTCT GGGCAAGGCC CGGGCCAGGA GAACCTGGG GCACTACAGG GGGTACTGCT CCAATGTGGA
 CCCACGGGT GCCAATGTCT TCACCCTGGC CTTCGGCTT GGCCACACA TGCTCCAGCC CTTATGTTC CTTGTGACA
 45 GTCAGTACCG GGCCTCCGA CCCAATGCG CTGTCCACT TAGCTCTGCC TTCTTTGCCA GCTGGCGGAT CGTGTATGAA
 GGTGACCAGG TTTTCCAGGG GCAAAATGGG GGTGAGGGTG GGGAGCATGC CCTCCCTAG GTGG-3' (FRAG. NO:) (SEQ ID
 NO:11856)
 5'-TCCAGCTGCT TCATGTCTCT CCAGAACTCT GTTCTCTGAC AAACGTTACT AACATACCCG ACTGGCTGTG CCAGCTCTGG
 GCTAGCTTGG CATCATGTGA TAACCAAGT AGCTTCCAG AGGCTGGTCC AATCTGTGCT GCTCACATTC CCTGCCACCA
 50 GGGGGCATCG ACCCATCTC CCGGGGCTC ATGGCCACCC CTGGCAAGCT GAACCGTCAG CATGCCATGT TATGTGATGA
 GCTCCGGGAC CGCTGTTTC GGCAAGTGAG GAGGATTTGG CTGGACCTGG CAGCTCTCAA CATGCAACGA AGCCGGGACC
 ACGGCCTTCC AGGTGAGGGG GCTGTCCACC TCTTCTCCA GCTTGTCTG GGCCAGGCTG CTCAAGGGGT TCTGGGAAGA
 CCCTGGTACC-3' (FRAG. NO:) (SEQ ID NO:11857)
 5'-CGACTGCTG GTAGTTCTG GTGGCAGAAA CGAGGTGTT TCACCAAAAG ACAGCGCAAG GCCCTGAGCA GAATTTCTT
 55 GTCTCGAATT ATATGTGACA ATACCGGTAT CACCACGGT TCAAGGGACA TCTTCAGAGC CAACATCTAC CCTCGGGGCT
 TTGTGAAGT CAGCCGTATC CCCAGTTGA ACCTATCAG CTGGCGAGG ACATGAGGCT TCTGCAGTA AGGGGAAGCC
 ACCTCAGCA CCTGGGCTG GTTAAGCCTC ACATCCCTCC CTGGATGGAT GGCTGAGTCC TCTTAGGTT CTAAGCAGAG
 AAAACAGAAC TTGTCACTAG GTACTCTTC CAAGTGGCTT CCAATGTGC TAGTTTCTGG GCTGACAGTC AATTCCAGGC
 CCTAGGACTT TGGGGGAAA TTAGGAGCAT CCAACTA-3' (FRAG. NO:) (SEQ ID NO:11858)
 5'-GAATTCGGTG GCCAGGACCC CTGCCAGGGC ACTGACCCAG CCTCCCTGG GGCAGTGGAG ACCTCGGTCC TGCAGAGCTG
 CATAGCAGAG GCCAAGTTC TGGTGGATGC TGCTTACAAT TGGACCCAGA AGAGCATCAA GCAGCGGCTT CGCAGCGGT
 CAGCCAGCCC CATGGACCTC CTGTCTACT TCAAAACAACC GGTAGCAGCC ACCAGGACAG TTGTTCCGGC CGCAGATTAT
 60 ATGATGTGG CTTTGGGGCT GCTTGAAGAG AAGTTACAAC CCCAGCGGTC CGGACCTTC ATTGTCACTG ATGTGCTAAC
 AGAACACAG CTGCGGCTGC TGTCCAGGC CAGTGGCTGT GCTCTCCGG ACCAGGCCGA GCCTGCAGC GACAAGTACC
 65 GCACCATCAC TGGACGGTGC AACAACAAGA GGAGACCTT GCTAGGGGCC TCAACCAAG CTCTGGCTCG CTGGCTGCC
 GCCAGTATG AGGATGGGCT GTGCTCCCTC TCCGCTGGA CCCCAGCAG GAGGCGCAAT GGCTTCTTGT TCCCTTGT
 CCGGGCTGTC TCAACCAAGA TTGTGCGCT CCCAATGAG AGACTGACCT CCGACCGTGG CCGAGCCCTC ATGTTCATGC
 AGTGGGGCCA GTTCATTGAC CATGACCTGG ACTTCTCCC GAGTCCCGG GCCAGAGTGG CCTTCACTGC AGGCGTTGAC
 TGTGAGAGGA CCTGCGCCA GCTGCCCTCC TGCTTTCCCA TGAAGATCCC ACCCAATGAC ACCCAATGAC AGAACCAAGC
 70 TGAATGCATC CTTTCTTCC GCTCGGCACC CTCATGCCCC CAAAACAAGA ACAGAGTCCG CAACAGATC AACCGCTCA
 CCTCTTTGT GGACGCCAGC ATGGGTATG GCAGTGAAGT CTCCTCTCG CTGCGGCTCC GCAACCGGAC CAACTACCTG
 GGGCTGCTGG CCATCAACCA GCGCTTTCAA GACAACGGG GGGCCCTGCT GCCCTTCGAC AACTGCAAG ATGACCCCTG
 TCTCTCACC AACCGCTCG CGCGCATCCC CTGCTTCTG GCAGGTGACA CCCGATCAAC GGAACCCCC AAAGTGGCAG
 CCATGCACAC CTCTTTATG CGAGAGCACA ACCGGTGGC CACCGAGCTG AGACGCTGA ATCCCCGGT GAATGGAGAC
 75 AAAGTGTACA ATGAGGCTCG GAAGATCATG GGGGCCATG TCCAGATCAT CACCTACCGA GACTTCTGCT CCTGGTTCT

- GGGCAAGGCC CGGGCCAGGA GAACCCTGGG GCACTACAGG GGGTACTGCT CCAATGTGGA CCCACGGGTG GCCAATGTCT
 TCACCCTGGC CTTCGCTTT GGCCACACAA TGCTCCAGCC CTTCATGTTC CGCTTGGACA GTCAGTACCG GGCCTCCGCA
 CCCAACTCGC ATGTCCCACT TAGCTCTGCC TTCTTTGCCA GCTGGCGGAT CGTGTATGAA GGGGGGCATCG ACCCCATCCT
 CCGGGGCGCTC ATGGCCACCC CTGCCAAGCT GAACCGTCAG GATGCCATGT TAGTGGATGA GCTCCGGGAC CGGCTGTTC
 5 GGC AAGTGAG GAGGATTGGG CTGGACCTGG CAGCTCTCAA CATGCAACGA AGCCGGGACC ACGGCTTCC AGGGTACAA
 GCTTGGAGGC GCTTCTGTGG GCTCTCCAG CCCCAGAAAT TGGCACAGCT TAGCCGGGTG CTGAAAAAACC AGGACTTGGC
 AAGGAAGTTC CTGAATTGT ATGGAACACC TGACAACATT GACATCTGGA TTGGGGCCAT CGCTGAGCCT CTTTTCGGG
 GGGCTCGAGT GGGGCTCTT CTGGCTTGTG TGTTTCGAGAA CCAGTTCAGA AGAGCCGAGA CGGAGACAGG TTCTGGTGGC
 AGAACGAGGT GTTTTACCA AAGACAGCGC AAGGCCCTGA GCAGAAATTC CTGTCTCGA ATTATATGTG ACAATACCGG
 10 TATCACCACG GTTTCAGGG ACATCTTACG AGCCAACATC TACCCTCGGG GCTTTGTGAA CTGCAGCCGT ATCCCCAGGT
 TGAACCTATC AGCCTGGCGA GGGACATGAG GCTTCTGCAG GAGTCTATCC CAAGTCTCCA ACTTTTGGAG ACAAGGGGAA
 GGGGAGGACC ATGAGGCTGC CTGTCTCCC TGGAGCAAGT GCAGGGCTCGT GACGCTTCTG CTGGCTACAG CTGAGAGCTG
 GGTTCGCCAG CCAGGAGTGA AGGCTGGGGG CTCCTATCAG CAATGGACCT TCCGCTTGG GAGCCTCTTA GGTATTAGGC
 TATGAATCAG CGCCACGTGC AAAGGCTTGG GAGCCAAAGCC ATGTGGTCTT GCACCCAGG CAAGAAAAAGT CAGCTGGAGG
 15 GTTACAGCA CTTTCTACTG TTTCCAGCC CTCCTCCCC TCCCTACCA TGAATAAGAG ACCACTCGGT CCTAGCCTCC
 AGACACCCCA CAATACTCCT CTGAGCCTGA GGCAGGCAG CATGCTCTGC TTCTACCAAT AAAGCACTGC CGGAATTC-3'
 (FRAG.NO:) (SEQ ID NO:11859)
 5'-TC GGC CTG GTC CCG G-3' (FRAG. NO: 1727) (SEQ ID NO:11109)
 5'-TGG GGG TTT CCG TTG-3' (FRAG. NO: 1728) (SEQ ID NO:11110)
 20 5'-TG GTC CCG GBG BGC -3' (FRAG. NO: 1729) (SEQ ID NO:11111)
 5'-GCG CTC GGC CTG GTC CCG G-3' (FRAG. NO:1053) (SEQ ID NO:10430)
 5'-GGG TCT CTT GTT GTT GC-3' (FRAG. NO:1054) (SEQ ID NO:10431)
 5'-TTG CGC CTC CTG CTG GGG GT CC-3' (FRAG. NO:1055) (SEQ ID NO:10432)
 5'-CTC TGT TCT TGT TTT GGG GGC-3' (FRAG. NO:1056) (SEQ ID NO:10433)
 25 5'-GGG CCC GGC CGT TGT CTT G-3' (FRAG. NO:1057) (SEQ ID NO:10434)
 5'-GTT TGG GGG TTT CCG TTG-3' (FRAG. NO:1058) (SEQ ID NO:10435)
 5'-GGG TTC TCC TGG CCC GGG CCT TGC CC-3' (FRAG. NO:1059) (SEQ ID NO:10436)
 5'-GGC CGT GGT CCC GGC TTC GTT GC-3' (FRAG. NO:1060) (SEQ ID NO:10437)
 5'-CCT GTC TCC GTC TCG GCT CTT CTG-3' (FRAG. NO:1061) (SEQ ID NO:10438)
 30 5'-GGG CCT TGC GCT GTC TTT GGT G-3' (FRAG. NO:1062) (SEQ ID NO:10439)
 5'-GCB CCG TCC BGT GBT GGT GCG GTB CTT GTC GCT GCB GCG CTC GGC CTG GTC CCG GBG BGC -3' (FRAG. NO:1063) (SEQ
 ID NO:10440)

Human Intercellular Adhesion Molecule-1 (ICAM-1)

Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-GCG CGG GCC GGG GGC TGC TGG G GGT TGG CCC GGG GTG CCC C GCC GCT GGG TGC CCT CGT CCT CTG CGG TC GTG
 TCT CCT GGC TCT GGT TCC CC GCT GCG CCC GTT GTC CTC TGG GGT GGC CTT C GCT CCC GGG TCT GGT TCT TGT GT TGG
 GGG TCC CTT TTT GGG CCT GTT GT GGC GTG GCT TGT GTG TTC GGT TTC TGC CCT GTC CTC CGG CGT CCC CGG BGC CTC
 CCC GGG GCB GGB TGB CTT TTG BGG GGG BCB CBG BTG TCT GGG CBT TGC CBG GTC CTG GGB BCB GBG CCC GCB GCB
 GGB CCB GGB GTG CGG GCB GCG CGG GCC GGG GGC TGC TGG GBG CCB TBG CGB GGC TGB G-3' (FRAG. NO: 1730) (SEQ
 40 ID NO:11112)
 5'-GGG GGC TGC TGG G-3' (FRAG. NO: 1731) (SEQ ID NO:11113)
 5'-T GTC CTC CGG CGT CCC-3' (FRAG. NO:1732) (SEQ ID NO:11114)
 5'-G CCB TBG CGB GGC TGB G-3' (FRAG. NO: 1733) (SEQ ID NO:11115)
 5'-CTC TGG GGT GGC CTT C-3' (FRAG. NO:1734) (SEQ ID NO:11116)
 45 5'-GCG CGG GCC GGG GGC TGC TGG G-3' (FRAG. NO:1064) (SEQ ID NO:10441)
 5'-GGT TGG CCC GGG GTG CCC C-3' (FRAG. NO:1065) (SEQ ID NO:10442)
 5'-GCC GCT GGG TGC CCT CGT CCT CTG CGG TC-3' (FRAG. NO:1066) (SEQ ID NO:10443)
 5'-GTG TCT CCT GGC TCT GGT TCC CC-3' (FRAG. NO:1067) (SEQ ID NO:10444)
 5'-GCT GCG CCC GTT GTC CTC TGG GGT GGC CTT C-3' (FRAG. NO:1068) (SEQ ID NO:10445)
 50 5'-GCT CCC GGG TCT GGT TCT TGT GT-3' (FRAG. NO:1069) (SEQ ID NO:10446)
 5'-TGG GGG TCC CTT TTT GGG CCT GTT GT-3' (FRAG. NO:1070) (SEQ ID NO:10447)
 5'-GGC GTG GCT TGT GTG TTC GGT TTC-3' (FRAG. NO:1071) (SEQ ID NO:10448)
 5'-TGC CCT GTC CTC CGG CGT CCC-3' (FRAG. NO:1072) (SEQ ID NO:10449)
 5'-CGG BGC CTC CCC GGG GCB GGB TGB CTT TTG BGG GGG BCB CBG BTG TCT GGG CBT TGC CBG GTC CTG GGB BCB GBG
 55 CCC CGB GCB GGB CCB GGB GTG CGG GCB GCG CGG GCC GGG GGC TGC TGG GBG CCB TBG CGB GGC TGB G-3' (FRAG.
 NO:1073) (SEQ ID NO:10450)

Human Vascular Cell Adhesion Molecule 1 (VCAM-1)

Nucleic Acid and Oligonucleotide Fragments

- 5'-CCT CTT TCT TGT TTT TCC C CTC TGC CTT TGT TTG GGT TCG CTT CCT TTC TGC TTC TTC C CTG TGT CTC CTG TCT CCG
 60 CTT TTT TCT TC GTC TTT GTT GTT TTC TCT TCC TTG CTG BGC BBG BTB TCT BGB TTC TGG GGT GGT CTC GBT TTT BBBB
 GCT TGB GBB GCT GCB BBC BTT BTC CBB BGT BTB TTT GBG GCT CCB BGG BTC BCG BCC BTC TTC CCB GGC BTT TTB BGT
 TGC TGT CGT-3' (FRAG.NO:1735) (SEQ ID NO:11117)
 5'-C TGT CGT-3' (FRAG. NO:1736) (SEQ ID NO:11118)
 5'-TGC TTC TTC C-3' (FRAG. NO:1737) (SEQ ID NO:11119)
 65 HSCVAMIAS1: 5'-CCT CTT TTC TGT TTT TCC C-3' (FRAG. NO:1074) (SEQ ID NO:10451)
 HSCVAMIAS2: 5'-CTC TGC CTT TGT TTG GGT TCG-3' (FRAG. NO:1075) (SEQ ID NO:10452)
 HSCVAMIAS3: 5'-CTT CCT TTC TGC TTC TTC C-3' (FRAG. NO:1076) (SEQ ID NO:10453)
 HSCVAMIAS4: 5'-CTG TGT CTC CTG TCT CCG CTT TTT TCT TC-3' (FRAG. NO:1077) (SEQ ID NO:10454)
 HSCVAMIAS5: 5'-GTC TTT GTT GTT TTC TCT TCC TTG-3' (FRAG. NO:1078) (SEQ ID NO:10455)
 70 CTG BGC BBG BTB TCT BGB TTC TGG GGT GGT CTC GBT TTT BBBB GCT TGB GBB GCT GCB BBC BTT BTC CBB BGT BTB TTT
 GBG GCT CCB BGG BTC BCG BCC BTC TTT CCB GGC BTT TTB BGT TGC TGT CGT (FRAG. NO:1079) (SEQ ID NO:10456)

Human Endothelial Leukocyte Adhesion Molecule (ELAM-1)

Nucleic Acid and Antisense Oligonucleotide Fragments

5-BBG TGB GBG CTG BGB BBB BCT GTG BBG CBB TCB TGB CTT CBB GBG TTC TTT TCB CCC GTT CTT GGC TTC TTC TGT C
 CGT TGG CTT CTC GTT GTC CC TGT GGG CTT CTC GTT GTC CC CCC TTC GGG GGC TGG TGG GGC CGT CCT TGC CTG CTG G
 GTT CTT GGC TTC TTC TGT CCG T TGG CTT CTC GTT GTC CC TGT GGG CTT CTC GTT GTC CC CCC TTC GGG GGC TGG TGG
 GGC CTT CTT TGC CTG CTG G CCTGAGACAG AGGCAGCAGT GATACCCACC TGAGAGATCC TGTGTTGAA CAACTGCTTC
 5 CCAAAACCGA AAGTATTTCA AGCCTAAACC TTGGGTGAA AAGAACTCTT GAAGTCATGA TTGCTTCAGA GTTCTCTCA
 GCTCTCACTT TGGTGTCTT CATTAAAGAG AGTGGAGCCT GGTCTTACAA CACCTCCACG GAAGCTATGA CTTATGATGA
 GGCCAGTGCT TATTGTCAAG AAAGGTACAC ACACCTGGTT GCAATTCAAA ACAAAGAAGA GATTGAGTAC CTAACCTCCA
 TATTGAGCTA TTCACCAAGT TATTACTGGA TTGGAATCAG AAAAGTCAAC AATGTGTGGG TCTGGGTAGG AACCCAGAAA
 CCTCTGACAG AAGAAGCCAA GAACTGGGCT CCAGGTGAAC CCAACAATAG GCAAAAAGAT GAGGACTCGG TGGAGATCTA
 10 CATCAAGAGA GAAAAAGATG TGGGCATGTG GAATGATGAG AGGTGCAGCA AGAAGAAGCT TGCCCTATGC TACACAGCTG
 CTGTATGCCA TACATCCTGC AGTGGCCACG GTGAATGTGT AGAGACCATC AATAATTACA CTTGCAAGTG TGACCTGGC
 TTCAGTGGAC TCAAGTGTGA GCAAATTGTG AACTGTACAG CCTGGAATC CCTGAGCAT GGAAGCCTGG TTGCAGTCA
 CCCACTGGGA AACTTCAGCT ACAATCTTC CTGCTCTATC AGCTGTGATA GGGGTTACCT GCCAAGCAGC ATGGAGACCA
 TGAAGTGTAT GTCTCTGGA GAATGGAGTG CTCCTATTCC AGCCTGCAAT GTGGTTGAGT GTGATGCTGT GACAAATCCA
 15 GCCAATGGGT TCGTGGAAATG TTTCCAAAC CCTGGAAGCT TCCATGGAA CACAACCTGT ACATTTGACT GTGAAGAAGG
 ATTTGAACTA ATGGGAGCCC AGAGCCTTCA GTGTACCTCA TCTGGGAATT GGGACAACGA GAAGCCAAAG TGTAAGCTG
 TGACATGCAG GGCCGTCCCG CAGCCTCAGA ATGGCTCTGT GAGGTGCAGC CATTCCCTGT CTGGGTAGT GACCTTCAAA
 TCATCCTGCA ACTTCACCTG TGAGGAAAGGC TCCATGTTGC AGGGACCAGC CCAGTTGAA TGACCCACTC AAGGGCAGTG
 GACACAGCAA ATCCCAGTTT GTGAAGCTTT CCAGTGCACA GCCTTGTCGA ACCCGAGCG AGGCTACATG AATTGTCTTC
 20 CTAGTGCTTC TGGCAGTTTC CGTTATGGGT CCAGCTGTGA GTTCTCTGT GAGCAGGGTT TTGTGTTGA GGGATCCAAA
 AGGCTCCAAT GTGGCCCCAC AGGGGAGTGG GACAACGAGA AGCCACATG TGAAGCTGTG AGATGCGATG CTGTCCACCA
 GCCCCGGAAG GGTITGGTGA GGTGTGCTCA TTCCCTATT GGAGAATTCA CCTACAAGTC CTCTGTGCC TTCAGCTGTG
 AGGAGGGATT TGAATTATAT GGATCAACTC AACTTGAGTG ACACATCTAG GGACAATGGA CAGAAGAGGT TCCTTCTGCG
 CAAGTGGTAA AATGTTCAAG CCTGGCAGTT CCGGAAAGA TCAACATGAG CTGCACTGGG GAGCCCGTGT TTGGCACTGT
 25 GTGCAAGTTC CCGTGTCTG AAGGATGGAC GCTCAATGGC TCTGCACTC GGACATGTGG AGCCACAGGA CACTGTCTGT
 GCCTGCTACC TACCTGTGAA GCTCCCACTG AGTCCAACAT TCCTTTGGTA GCTGGACTTT CTGCTGCTGG ACTCTCCCTC
 CTGACATTAG CACCATTCTT CCTCTGGCTT CGGAAATGCT TACGGAAGC AAAGAAATTT GTTCTGCCA GCAGTGCCTA
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	ATAAAGTCCA	AGATATTCAG	ACAGGACAGC	CTAGCTACTT	GCTGTCTTTC	AGCTGTCTTG	ATTTGTGTCC	AACCATATTC
	ACCCCTAAG	CTTCCAGAAT	AACTTCACTT	CTGTCTTTTA	CAGAAGAGGT	GCAGTATTTT	ATTTTGGTAA	GTACAGCTCC
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15	AGCCCTAAGT	GTATAGAAGT	GGGGGTAATT	TGGCAATAAT	TAGTAAAGAC	TAATTCTGGTG	GCAGAGCAAA	CGCAAACTAG
	GGCAGTGCAG	TAGTTTGGAG	AGACCTGTAG	AAATAAGAAAG	CAACTTTTAT	GAGAATCTTC	TATCTACTGC	GCTAGACACT
	ATACCATCTG	CCTCAATTTT	CACAGTTCTG	GCAAGTGGGA	TCITTTGTCC	CTTTATACAA	GATTTACAA	TTGGGGGAGA
	GGCGGGTTCAC	CCAGTCCCGC	GGCTAGGAAC	GCGCTCTTTT	CCTCTCCCAT	CACGCTGCAA	GGCTTGGAGT	CACCTCCGGC
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	CGGACCTAAA	TCGCGCACCA	GTGAGTCGAG	TCTCCAGGG	GCTAGAGAAG	CCCGACTTTC	TTTCCGGCCT	TGAGGGACCC
	GGGCTCACCA	AGAAACCCAGC	CGCCCTCCTC	TCTATGGTTT	TGGAGCCGGC	GGAGAGCCGC	CAAGGGTGGG	CGGAGCTGGC
	AGTTTCCGGT	CTGGGCTTTG	GCGGGTCTGG	TTTGAAGCTC	TCTGTGTTGA	CGAAAGTATG	TCTCAGGAAG	GTGCGGTCCG
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- 5'-CCT TGC CTG CTG G-3' (FRAG. NO: 1739) (SEQ ID NO:11121)
 5'-GTT GTC CC-3' (FRAG. NO: 1740) (SEQ ID NO:11122)
 5'-GTT CTT GGC TTC TTC TGT C-3' (FRAG. NO:1080) (SEQ ID NO:10457)
 5'-GGC TGG TGG-3' (FRAG. NO:1083) (SEQ ID NO:10461)
 5'-CGT TGG CTT CTC GTT GTC CC-3' (FRAG. NO:1081) (SEQ ID NO:10458)
 5'-TGT GGG CTT CTC GTT GTC CC-3' (FRAG. NO:1082) (SEQ ID NO:10459)
 5'-CCC TTC GGG GGC TGG TGG-3' (FRAG. NO:1083) (SEQ ID NO:10460)
 5'-GGC CGT CCT TGC CTG CTG G-3' (FRAG. NO:1084) (SEQ ID NO:10462)
- Human P Selectin Fragments**
 10 5'-TTT TCT CTT TCG CTT TCT TTT CGT CTC CTG TTC CTC CTT TT TTG CTG TTT TTT CTC CTT CTT CTC TCC TTT CTT TTC-3' (FRAG. NO: 1741) (SEQ ID NO:11123)
 5'-TCC TTT CTT TTC-3' (FRAG. NO: 1742) (SEQ ID NO:11124)]
 5'-CTC CTT TT-3' (FRAG. NO:1743) (SEQ ID NO:11125)
 5'-TTT TCT CTT TCG CTT TCT TTT CGT CTC CTG TTC CTC CTT TT-3' (FRAG. NO:1085) (SEQ ID NO:10463)
 15 5'-TTG CTG TTT TTT CTC CTT CTT CTC TCC TTT CTT TTC-3' (FRAG. NO:1086) (SEQ ID NO:10464)
- Human Endothelial Monocyte Activating Factor**
 Nucleic Acid & Antisense Oligonucleotide Fragments
 5'-TTT TCT CTT TCG CTT TCT TTT CGT CTC CTG TTC CTC CTT TT TTG CTG TTT TTT CTC CTT CTT CTC TCC TTT CTT TTC-3' (FRAG. NO: 1744) (SEQ ID NO:11126)
 20 5'-CC TTT CTT TTC (FRAG. NO: 1745) (SEQ ID NO:11127)
 5'-CTG TTC CTC CTT TT-3' (FRAG. NO:1746) (SEQ ID NO:11128)
 5'-TTT TCT CTT TCG CTT TCT TTT CGT CTC CTG TTC CTC CTT TT-3' (FRAG. NO:1087) (SEQ ID NO:10465)
 5'-TTG CTG TTT TTT CTC CTT CTT CTC TCC TTT CTT TTC-3' (FRAG. NO:1088) (SEQ ID NO:10466)
- Human IL3 Nucleic Acid and Antisense Oligonucleotide Fragments**
 25 5'-CTC TGT CTT GTT CTG GTC CTT CGT GGG GCT CTG TGT CGT GTC G GTG CGG CCG TGG CC GGC GGB CCB GGB GTT GGB GCB GGB GCB GGB CGG GCB GGC GGC TCB TGT TTG GBT CGG CBG GBG GCB CTC (FRAG. NO: 1747) (SEQ ID NO:11129)]
 5'-G GBG GCB CTC-3' (FRAG. NO: 1748) (SEQ ID NO:11130)
 5'-GT GGG GCT CTG-3' (FRAG. NO:1749) (SEQ ID NO:11131)
 HUMIL3AAS1: 5'-CTC TGT CTT GTT CTG GTC CTT CGT GGG GCT CTG-3' (FRAG. NO:1089) (SEQ ID NO:10467)
 30 HUMIL3AAS2: 5'-TGT CGC GTG G GTG CGG CCG TGG CC-3' (FRAG. NO:1090) (SEQ ID NO:10468)
 GGC GGB CCB GGB GTT GGB GCB GGB GCB GGB CGG GCB GGC GGC TCB TGT TTG GBT CGG CBG GBG GCB CTC (FRAG. NO:1091) (SEQ ID NO:10469)
- Human IL3 Receptor Nucleic Acid and Antisense Oligonucleotide Fragments**
 35 5'-TCT GGG GTC TCC TGG CCT TCG TGG TTC CTC TTC CTT CGT TTG CCG TCC GCG GGC CCC GGG CCT GGC TGC GCT CCT GCC CCG CCT CTT TCC CGG GCT CTT GCG CTG GGG GGT GCT CC CGT GTG TTT GCG CCC TC CTC CTG GTC GCG CTT GTC GTT TTG GGG CCG GCT TTG CCC GCC TCC CGG CGC CTG GCC CGG CC TTC CTG GGC TGC GTG CGC GTT CTG TTC TTC TTC CTG GCT CTT GCG GGT CCT GGC CTT CGT GGT TCC TCT TCC TTC GTT TGC CGT CCG GCG GGG CCC CCG GGC CT GGC TGC GCT CCT GCG CCG CCT CTT TCC CGG GCT CTT GCG CTG GGG GGT GCT CCC GTG TGT TTG CGC CCT CCT CTT GGT CGC GCT TGT CGT TTT GG GGC CGG CTT TGC CCG CCT CCC GGC GCC TGG CCC GGC CTT CCT GGG CTG CGT GCG CGT TCT GTT CTT CTT CCT GGC GCA GGA GAC AGG GCA GGG CGA TCA GGA GCA GCG TGA GCC AAA GGA GGA CCA TCG GGA ACG CAG CTC CGG AAC GCA GGA CAG AGG TGC C GC BGG BGB CBG GGC BGG GCG BTC BGG BGC BGC GTG BGC CBB BGG BGG BCC BTC GGG BBC GCB GCT CCG GBB CGC BGG BCB GBG GTG CC-3' (FRAG. NO: 1750) (SEQ ID NO:11132)
 GBG GTG CC-3' (FRAG. NO: 1751) (SEQ ID NO:11133)
 5'-GCC CCG C-3' (FRAG. NO:1752) (SEQ ID NO:11134)
 45 5'-TCTGGGGTGTCTCG (FRAG. NO:1092) (SEQ ID NO:10470)
 5'-GCCTTCGTGGTTCC (FRAG. NO:1093) (SEQ ID NO:10471)
 5'-TCTTCCTTCGTTTGC (FRAG. NO:1094) (SEQ ID NO:10472)
 5'-CGTCCGCGGGGCCCCCGGCCT (FRAG. NO:1095) (SEQ ID NO:10474)
 5'-GGC TGC GCT CCT GCC CCG C (FRAG. NO:1096) (SEQ ID NO:10473)
 50 5'-CTCTTTCCCGGGCTCTT (FRAG. NO:1097) (SEQ ID NO:10475)
 5'-GCGCTGGGGGGTGCTCC (FRAG. NO:1098) (SEQ ID NO:10476)
 5'-CGTGTGTTTGCGCCCTCCTCTGGTCGC (FRAG. NO:1099) (SEQ ID NO:10477)
 5'-GCTTGTCGTTTGG (FRAG. NO:1100) (SEQ ID NO:10478)
 5'-GGCCGGCTTTGCCCGCCTCCC (FRAG. NO:1101) (SEQ ID NO:10479)
 55 5'-GGCGCTGGCCCGGCC (FRAG. NO:1102) (SEQ ID NO:10480)
 5'-TTCTGGGCTGCGTGCGC (FRAG. NO:1103) (SEQ ID NO:10481)
 5'-GTTCTGTCTTCTCTCTGGC (FRAG. NO:1104) (SEQ ID NO:10482)
 5'-GCB GGB GBC BGG GCB GGG CGB TCB GGB GCB GCG TGB GCC BBB GGB GGB CCB TCG GGB BCG CBG CTC CGG BBC GCB GGB 5'-CBG BGG TGC C (FRAG. NO:1105) (SEQ ID NO:12488)
- Human IL-4 Nucleic Acid and Antisense Oligonucleotide Fragments**
 60 5'-CTC TGG TTG GCT TCC TTC GCC GGC BCB TGC TBG CBG GBB GBB CBG BGG GGG BBG CBG TTG GGB GGT GBG BCC CBT TBB TBG GTG TCG B-3' (FRAG. NO: 1753) (SEQ ID NO:11135)
 5'-GCC GGC BCB-3' (FRAG. NO: 1754) (SEQ ID NO:11136)
 5'-T TCC TTC-3' (FRAG. NO:1755) (SEQ ID NO:11137)
 65 5'-CTC TGG TTG GCT TCC TTC-3' (FRAG. NO:1106) (SEQ ID NO:10484)
 5'-GCCGGCBCTGCTBGCBBGBBBBGBBGBGGGGGBBGBGTTGGGGGTGBGBCCCBTTBTTBGGTGTGCB-3' (FRAG. NO:1107) (SEQ ID NO:10485)
- Human IL4 Receptor Nucleic Acid and Antisense Oligonucleotide Fragment**
 70 5'-TCT GCC CTG TCC GCC GGC TCT TCG GTG GCT CGG CCC CGC TCC TTG TCT TGC CGC GGG TTG GTT CCT GGG CCT GGT TCT TGC GGG CGT TTC GGT CTG CTG GCT GGT CTG GGC CCG CGG TGC GGC GGG TGG CTT GCT GTT CTG CCT GGG CTC TCC CCT CTC CTC CTT TTC CTT CCT CTG TCT TGC CTC CTT CCT CTG GGT CCT CTT GGC CTG GGC GCT CTT CCC CTC GGG CGG CTG CGG GCG CTC GTG CTG CCT GGT CCG CTC CTT GGG GGT GCT CCT TCC CTT TCC CCG CTC GTG GGG TTT GCG GGG CTG GGC TGC CCT GGG GGG TCT GGG CCT TTT GGG GTC GGC TGG CTG CTG CTT CGG GCC GCC TGG GCT TCC CTG TGC CCC

- TTT CCT CTG CTG GGT CCC CCT CCC GTT CCA AGC TGC ACC GCA CAG ACC GGC GCT ACA GGA CAG AGC CAG GCA AGC
ACC CAT GGG GAT CCA GGC CCA GCT GTT CCB BGC TGC BCC GCB CBG BCC GGC GCT BCB GGB CBG BGC CBG GCB BGC
BCC CBT GGG GBT CCB GGC CCB GCT G -3' (FRAG. NO: 1756) (SEQ ID NO: 11138)
5'-TCTGCGC-3' (FRAG. NO: 1757) (SEQ ID NO: 11139)
- 5 5'-CCT GCT CCT GGG G (FRAG. NO: 1758) (SEQ ID NO: 11140)
5'-TCTGCGCGCCCTGCTCC (FRAG. NO: 1108) (SEQ ID NO: 10486)
5'-CGCCCGGCTTCTCT (FRAG. NO: 1109) (SEQ ID NO: 10487)
5'-CGTGTGGGCTTCGG (FRAG. NO: 1110) (SEQ ID NO: 10488)
5'-CCCCGCGCCTCCGTTGTTCTC (FRAG. NO: 1111) (SEQ ID NO: 10489)
- 10 5'-TGCTCGCTGGGCTTG (FRAG. NO: 1112) (SEQ ID NO: 10490)
5'-GGTTTCCTGGGGCCCTGGGTTC (FRAG. NO: 1113) (SEQ ID NO: 10491)
5'-TCTGCGGGTCTGTTTTT (FRAG. NO: 1114) (SEQ ID NO: 10492)
5'-GGGTGCTGGCTCGG (FRAG. NO: 1115) (SEQ ID NO: 10493)
5'-CTTGGTGTGGGGCTCC (FRAG. NO: 1116) (SEQ ID NO: 10494)
- 15 5'-GGCGGCTGCGGGCTGGGTGGG (FRAG. NO: 1117) (SEQ ID NO: 10495)
5'-CTTGGCTGGTTCCTGGCCTCGGG (FRAG. NO: 1118) (SEQ ID NO: 10496)
5'-CCTCCTCCTCCTCCTCGCTCCCTTTTCTTCTCT (FRAG. NO: 1119) (SEQ ID NO: 10497)
5'-TCCCTGCTGCTCTC (FRAG. NO: 1120) (SEQ ID NO: 10498)
5'-TGCCCTCCCTTCCCTCCTGG (FRAG. NO: 1121) (SEQ ID NO: 10499)
- 20 5'-GGTGCTCCTTGGGCCCTGC (FRAG. NO: 1122) (SEQ ID NO: 10500)
5'-GGCTGCTCCTTGGCCC (FRAG. NO: 1123) (SEQ ID NO: 10501)
5'-CTCTGGGTGCGGCTGGC (FRAG. NO: 1124) (SEQ ID NO: 10502)
5'-GGGGCGTCTCTGTGC (FRAG. NO: 1125) (SEQ ID NO: 10503)
5'-CTGGCCTGGGTGCC (FRAG. NO: 1126) (SEQ ID NO: 10504)
- 25 5'-GCCTCTCCTGGGGGGTGGCTCCCTGTCC (FRAG. NO: 1127) (SEQ ID NO: 10505)
5'-CCTTTTCCCCGGCTCC (FRAG. NO: 1128) (SEQ ID NO: 10506)
5'-GTGGGGGCTTTGGC (FRAG. NO: 1129) (SEQ ID NO: 10507)
5'-GGG GGT CTG TGG CCT GCT CCT GGG G (FRAG. NO: 1130) (SEQ ID NO: 10508)
5'-AGGGGTCTGGGGCCCTC (FRAG. NO: 1131) (SEQ ID NO: 10509)
- 30 5'-TTTTGGGGGTCTGGCTTG (FRAG. NO: 1132) (SEQ ID NO: 10510)
5'-GCCTGGCTGCCTTCC (FRAG. NO: 1133) (SEQ ID NO: 10511)
5'-GGGGCCTGCCGTGGGGC (FRAG. NO: 1134) (SEQ ID NO: 10512)
5'-TGCTCTGTGTTGCTCCCTT (FRAG. NO: 1135) (SEQ ID NO: 10513)
5'-TGCTGTGCTGTGG (FRAG. NO: 1136) (SEQ ID NO: 10514)
- 35 5'-GGTCCCGCCTTCCCT (FRAG. NO: 1137) (SEQ ID NO: 10515)
5'-GTT CCC AGA GCT TGC CAC CTG CAG CAG GAC CAG GCA GCT CAC AGG GAA CAG GAG CCC AGA GCA AAG CCA CCC CAT
TGG GAG ATG CCA AGG CAC CAG GCT G (FRAG. NO: 1138) (SEQ ID NO: 10516)
5'-GTT CCC BGB GCT TGC CBC CTG CBG CBG GBC CBG GCB GCT CBC BGG GBB CBG GBG CCC BGB GCB BBG CCB CCC CBT
TGG GBG BTG CCB BGG CBC CBG GCT G -3' (FRAG. NO: 1139) (SEQ ID NO: 10517)
- 40 **Human IL5 Nucleic Acid and Antisense Oligonucleotide Fragments**
5'-TCCCTGTTTC CCCCCTTTCG TCTGCGTTC GCCTTGGCG TTTTGTGTT GTTTCTCTC TCCGTCTTC TTCTCCCT
GTGGGBTTT CTGTGGGGBT GGCBTBCBG TBGGCBGCTC CBGBGCTBG CBBBCTCBBB TGCBBGBGCB TCCTCBTGGC
TCTGBBBGCG TGGAATTTCT TGTGGGGBTG GCATACAGT AGGCAGCTCC AAGAGCTAGC AAACCTCAAT GCAGAAGCATC
CTCATGGCTC TGAACG-3' (FRAG. NO: 1759) (SEQ ID NO: 11141)
5'-GCC CCG GG-3' (FRAG. NO: 1760) (SEQ ID NO: 11142)
5'-G GGT TTC T-3' (FRAG. NO: 1761) (SEQ ID NO: 11143)
5'-GTG GGG BTG GC-3' (FRAG. NO: 1762) (SEQ ID NO: 11144)
5'-CCB BGB GCT BGC-3' (FRAG. NO: 1763) (SEQ ID NO: 11145)
5'-TCC CTG TTT CCC CCC TTT-3' (FRAG. NO: 1140) (SEQ ID NO: 10518)
5'-CGT TCT GCG TTT GCC TTT GGC-3' (FRAG. NO: 1141) (SEQ ID NO: 10519)
5'-GTT TTT TGT TTG TTT TCT-3' (FRAG. NO: 1142) (SEQ ID NO: 10520)
5'-CTC TCC GTC TTT CTT CTC C-3' (FRAG. NO: 1143) (SEQ ID NO: 10521)
5'-CCT CCT GCC TGT GTC CCT GCT CCC C-3' (FRAG. NO: 1144) (SEQ ID NO: 10522)
5'-GAG GGT TTC TGG CTT CCT CTC T-3' (FRAG. NO: 1145) (SEQ ID NO: 10523)
5'-TGT CTC TCT GTC CTT TTG TT-3' (FRAG. NO: 1146) (SEQ ID NO: 10524)
5'-TGT TGT GCG GCC TGG TGC TGC CCT GCC CCG GG-3' (FRAG. NO: 1147) (SEQ ID NO: 10525)
5'-GTG GGA ATT TCT GTG GGG BTG GCA TAC ACG TAG GCA GCT CCA AGA GCT AGC AAA CTC AAA TGC AGA AGC ATC CTC
ATG GCT CTG AAA CG-3' (FRAG. NO: 1764) (SEQ ID NO: 11146)
5'-GTG GGB BTT TCT GTG GGG BTG GCB TBC BCG TBG GCB GCT CCB BGB GCT BGC BBB CTC BBB TGC BGB BGC BTC CTC
BTG GCT CTG BBB CG-3' (FRAG. NO: 1148) (SEQ ID NO: 10526)
- 60 **Human IL-5 Receptor Nucleic Acid and Antisense Oligonucleotide Fragments**
5'-CTCAGTGGCC CCAAAAGGA TGAGTAATAC ATGCGCCACG ATGATCATAT CCTTTTACT ATGAGGCCGT GTCTGTGCTG
TCTTTCCTTT GCTCTTGGTG TGTCTTTGCT GTGCCCTGCC TCCTGCCCCG TGCTGTGCTG GTCTTTCCTT TGCTCTTGGT
GTGTCTTTGC TGTGCCCTGC CTCTCTGCC CGTGTCTGTC GTGTCTTCC TTTGCTCTTG GTGTGTCTTT GCTGTGCCCT
GCCTCTCTGC-3' (FRAG. NO: 1765) (SEQ ID NO: 11147)
5'-CCG TGT C-3' (FRAG. NO: 1766) (SEQ ID NO: 11148)
5'-GCCCTGCC-3' (FRAG. NO: 1767) (SEQ ID NO: 11149)
5'-CCG TGT CTG TCG TGT CT-3' (FRAG. NO: 1149) (SEQ ID NO: 10527)
5'-TTCTTTGCTCTTG-3' (FRAG. NO: 1150) (SEQ ID NO: 10528)
5'-GTGTGTCTTTGCTGT-3' (FRAG. NO: 1151) (SEQ ID NO: 10529)
5'-GCCCTGCTCTCTGC-3' (FRAG. NO: 1152) (SEQ ID NO: 10530)
5'-CT CBGTGGCCCC CBBBGGBTG BGTBBTBCBT GCGCCBCBT GBTCBTBTCC TTTTBCIBT GBGG (FRAG. NO: 1768) (SEQ
ID NO: 11150)
- 70 **Human IL-6 Receptor Fragments**

- 5'-GGGGGTGGCT TCCTGCCGCG TCTCTGGGCC GTCCCGTCCC TCGGCCCCGC GCCGCGCTCG GCTCCTCTCC CTCTGGCCCG
GCTCGGGGCG GGGCGGGGCG GTGGGCGGGC GGCGCTGCC TCGCGCGGCG GCTGGCCCTT GCTGGCCGTC GGCTGCGGCG
TGCTGGCTGC CTTGCTGGCC GCGCCGGGCG CTGTCCGCTT CTGCGGGGCG TGCTCTCTGG CTGTCTCTCC GGCTCTTCTG
CTGGGGTGGG GCTGGGCGGC CGGCCCGGTG CTGGGGCTCC TCGGGGGGGG GGGCTCTTCC GGGCTGTCTC CCTCCGGGGC
5 GGGGGTTTCT GGGCGTGGGG GTCTTGCTTG GCCTCCGGGC TCCTGCTTGT CTGCTCTTCC TTCTCTGGTC GGTGTGGCT
CGGGGCTCCG TGGGTCCCTG GCGCCCGTTT GTGTTTGTG TTTTCCCTG GCGTCCCTGT GCCCTCTCC TCTCTTCTT
CTGCTTCTCG CTCTCCTTG TGGGGCCCTC CTGTGTGCTC TTGGTTTGG GCTTTTCTT TCTTCTCTT TTTCGTGCG
TGGGCTCCG CACGCTCTT GCCACCTCT GCGCAGGGCA GCGCCTTGG GGCCAGCGCC GCTCCCGGCG CGGCCAGCAG
10 GGCAGCCAGC AGCGCGCAGC CGACGGCCAG CATGCTTCTT CCTCGGCTAC CACTCCATGG TCCCGCAGAG GCGGACAGGC
GCBGCGCTC TTGCCBCCTC CTGCGCBGGG CBGCGCCTTG GGGCCBGC GCCTCCCGGC GCGGCCBGC BGGCBGCCBG
CBGCGCGCBG CCGBCGGCCB GCBTGCTTCC TCCTCGGCTB CCBCTCCBTG GTCCGCBGB GCGGBCBGG C-3' (FRAG. NO:
1769) (SEQ ID NO:1151)
5'-CCCGGCGC-3' (FRAG. NO:1184) (SEQ ID NO:10562)
5'-GGCCBGCBBG-3' (FRAG. NO:1186) (SEQ ID NO:10564)
15 5'-GCBGCCBGCBBG-3' (FRAG. NO:1770) (SEQ ID NO:11152)
5'-C GCBGCCBGCBBG-3' (FRAG. NO:1771) (SEQ ID NO:11153)
5'-GGGGGTGGCTTCTTCCGCT-3' (FRAG. NO:1153) (SEQ ID NO:10531)
5'-GCGTCTCTGGGCCCTCC-3' (FRAG. NO:1154) (SEQ ID NO:10532)
5'-GTCCCTCGGGCCCGCGCGCTCGGCTCCTCTCC-3' (FRAG. NO:1155) (SEQ ID NO:10533)
20 5'-TCTGGCCCGGCTC-3' (FRAG. NO:1156) (SEQ ID NO:10534)
5'-GGGGCGGGGCGGGGCGGTGGGCGGGC-3' (FRAG. NO:1157) (SEQ ID NO:10535)
5'-GGCGCTGCCCTGCGC-3' (FRAG. NO:1158) (SEQ ID NO:10536)
5'-GCGGCGCTGGCCCC-3' (FRAG. NO:1159) (SEQ ID NO:10537)
5'-TGCTGGCGCTGGCTGCGCGCTGCTGGCTGCCCT-3' (FRAG. NO:1160) (SEQ ID NO:10538)
25 5'-GCTGGCGCGCGCGGG-3' (FRAG. NO:1161) (SEQ ID NO:10539)
5'-GCCTGTCCGCTCTGCGGG-3' (FRAG. NO:1162) (SEQ ID NO:10540)
5'-CGCTGTCTCCTTGGC-3' (FRAG. NO:1163) (SEQ ID NO:10541)
5'-TTGTCTTCCGCTCT-3' (FRAG. NO:1164) (SEQ ID NO:10542)
5'-TCTGCTGGGGTGGG-3' (FRAG. NO:1165) (SEQ ID NO:10543)
30 5'-GCTGGGCGGGCGGGCCCGGT-3' (FRAG. NO:1166) (SEQ ID NO:10544)
5'-GCTGGGGCTCTCGGGGGG-3' (FRAG. NO:1167) (SEQ ID NO:10545)
5'-GGGGGCTCTTCCGG-3' (FRAG. NO:1168) (SEQ ID NO:10546)
5'-GCTGTCTCCTTCCGGG-3' (FRAG. NO:1169) (SEQ ID NO:10547)
5'-GCGGGGGTTTCTGGCC-3' (FRAG. NO:1170) (SEQ ID NO:10548)
35 5'-GTGGGGGTCTTGCC-3' (FRAG. NO:1171) (SEQ ID NO:10549)
5'-TGGCTTCCGGGCTCC-3' (FRAG. NO:1172) (SEQ ID NO:10550)
5'-TGCTTGTCTTGCCTTCTTCC-3' (FRAG. NO:1173) (SEQ ID NO:10551)
5'-TCTGGTGGTTGTGGCTCG-3' (FRAG. NO:1174) (SEQ ID NO:10552)
5'-GGGCTCCGTGGGTCCCTGGC-3' (FRAG. NO:1175) (SEQ ID NO:10553)
40 5'-GCCCGTTTGTGTTTGTGTC-3' (FRAG. NO:1176) (SEQ ID NO:10554)
5'-TTTTCCCTGGCGT-3' (FRAG. NO:1177) (SEQ ID NO:10555)
5'-CCCTGTGCCCTCTCCTCTCCTCTCTGCTTCTC-3' (FRAG. NO:1178) (SEQ ID NO:10556)
5'-GCTCTCTTGTGGG-3' (FRAG. NO:1179) (SEQ ID NO:10557)
5'-GCCCTCCCTGCTGCT-3' (FRAG. NO:1180) (SEQ ID NO:10558)
45 5'-CTTGGTTTGGGCT-3' (FRAG. NO:1181) (SEQ ID NO:10559)
5'-TTTTTCTCTCTCCTCTTCTTTC-3' (FRAG. NO:1182) (SEQ ID NO:10560)
5'-GTGCGTGGGCTCC-3' (FRAG. NO:1183) (SEQ ID NO:10561)
5'-GCACGCTCT TGCCACCTCC TCGCAGGGC AGCGCTTGG GGCCAGCGCC GCTCCCGGCG CGGCCAGCAG GGCAGCCAGC
AGCGCGCAGC CGACGGCCAG CATGCTTCTT CCTCGGCTAC CACTCCATGG TCCCGCAGAG GCGGACAGGC-3' (FRAG. NO:1185)
50 (SEQ ID NO:10563)
5'-GCBGCGCTCT TGCCBCCTCC TGCGBGGGC BGCCTTGG GGCCBGCGCC GCTCCCGGCG CGGCCBGCGB GGCBCGCCBG
CBGCGCGCBG CCGBCGGCCB GCBTGCTTCC TCCTCGGCTB CCBCTCCBTG GTCCGCBGB GCGGBCBGG C-3' (FRAG. NO:1187)
(SEQ ID NO:10565)

Human IL-6 Nucleic Acid and Antisense Oligonucleotide Fragments

- 55 5'-GGGGGTGGCT TCCTGCCGCG TCTCTGGGCC GTCCCGTCCC TCGGCCCCGC GCCGCGCTCG GCTCCTCTCC CTCTGGCCCG
GCTCGGGGCG GGGCGGGGCG GTGGGCGGGC GGCGCTGCC TCGCGCGGCG GCTGGCCCTT GCTGGCCGTC GGCTGCGGCG
TGCTGGCTGC CTTGCTGGCC GCGCCGGGCG CTGTCCGCTT CTGCGGGGCG TGCTCTCTGG CTGTCTCTCC GGCTCTTCTG
CTGGGGTGGG GCTGGGCGGC CGGCCCGGTG CTGGGGCTCC TCGGGGGGGG GGGCTCTTCC GGGCTGTCTC CCTCCGGGGC
60 GGGGGTTTCT GGGCGTGGGG GTCTTGCTTG GCCTCCGGGC TCCTGCTTGT CTGCTCTTCC TTCTCTGGTC GGTGTGGCT
CGGGGCTCCG TGGGTCCCTG GCGCCCGTTT GTGTTTGTG TTTTCCCTG GCGTCCCTGT GCCCTCTCC TCTCTTCTT
CTGCTTCTCG CTCTCCTTG TGGGGCCCTC CTGTGTGCTC TTGGTTTGG GCTTTTCTT TCTTCTCTT TTTCGTGCG
TGGGCTCCG GCACGCTCT TGCCACCTCC TGCAGAGGC AGCGCTTGG GGCCAGCGCC GCTCCCGGCG CGGCCAGCAG
GGCAGCCAGC AGCGCGCAGC CGACGGCCAG CATGCTTCTT CCTCGGCTAC CACTCCATGG TCCCGCAGAG GCGGACAGGC
GCBGCGCTC TTGCCBCCTC CTGCGCBGGG CBGCGCCTTG GGGCCBGC GCCTCCCGGC GCGGCCBGC BGGCBGCCBG
65 CBGCGCGCBG CCGBCGGCCB GCBTGCTTCC TCCTCGGCTB CCBCTCCBTG GTCCGCBGB GCGGBCBGG C-3' (FRAG.
NO:1772) (SEQ ID NO:11154)
5'-GGGGCBGG-3' (FRAG. NO:1773) (SEQ ID NO:11155)
5'-GBBGGCBG CBGGC-3' (FRAG. NO:1774) (SEQ ID NO:11156)
5'-CCBGGCBGCBC CCC-3' (FRAG. NO:1775) (SEQ ID NO:11157)
70 5'-BGGG BGGGGCBBC-3' (FRAG. NO:1776) (SEQ ID NO:11158)
5'-GCT TCT CTT TCG TTC CCG GTG GGC TCG-3' (FRAG. NO:1188) (SEQ ID NO:10566)
5'-GTG CCT GTC TGT GTG GGG CGG CT-3' (FRAG. NO:1189) (SEQ ID NO:10567)
5'-GTG CCT CTT TGC TGC TTT C-3' (FRAG. NO:1190) (SEQ ID NO:10568)
5'-GAT TCT TTG CCT TTT TCT GC-3' (FRAG. NO:1191) (SEQ ID NO:10569)

5'-CTCCTGGGGG TBCTGGGGCB GGGBBGGCBG CBGGCBBCB CBGGGCBGC CCCBGGGBB BGGCBCTGG BCCGBBGGCG
CTGTGGGBG BGGBTTCBT BGCTGGGCTC CTGGBGGGB GBTBGGC-3' (FRAG. NO:1777) (SEQ ID NO:11159)

Human Monocyte-derived Neutrophil Chemotactic Factor

Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-GGGGTGGBBB GGTTTGGBT BTGCTTTBT GCBCTGBCBT CTBBGTTCTT TBGCBCTCCT TGGCBBBCT GCBCTTCBC
BCBGBGCTGC BGGBTTCBG BGGCTGCCB BGGBGGCCB GGCCBGCCTG GBBGTCBTGT TTBCBCBCBG TGBGTGTT
CCTTCCGGGC TTGTGTCTC TGCTGTCTCT TGGTCTTC CGTGTTTC TTCTGGCTC TTGCTCTTC TCTTGG CCCT TGGC-3'
(FRAG. NO:1778) (SEQ ID NO:11160)
- 5'-GGBGT BTG-3' (FRAG. NO:1779) (SEQ ID NO:11161)
- 10 5'-GCBCTGBCBT CT-3' (FRAG. NO:1780) (SEQ ID NO:11162)
- 5'-CCG GTG G-3' (FRAG. NO:1781) (SEQ ID NO:11163)
- 5'-GG CCC TTG GC-3' (FRAG. NO:1782) (SEQ ID NO:11164)
- 5'-GCT TGT GTG CTC TGC TGT CTC T-3' (FRAG. NO:1192) (SEQ ID NO:10570)
- 5'-TGG TTC CTT CCG GTG GTT TCT TCC TGG CTC TTG TCC T-3' (FRAG. NO:1193) (SEQ ID NO:10571)
- 15 5'-TTC TCT TGG CCC TTG GC-3' (FRAG. NO:1194) (SEQ ID NO:10572)
- 5'-GGGGTGGBBB GGTTTGGBT BTGCTTTBT GCBCTGBCBT CTBBGTTCTT TBGCBCTCCT TGGCBBBCT GCBCTTCBC
BCBGBGC-3' (FRAG. NO:1783) (SEQ ID NO:11165)

Human Neutrophil Elastase (Medullasin) Nucleic Acid and Antisense Oligonucleotide Fragments

- 20 5'-GGGCTCCCGC CGCGBBGGT TBTGGGCTCC CBGGBCBCC CGCBCCGCGC GGBCGTTTBC BTTCGCCBCG CBGTGCGCGG
CCGBCBTGBC GBBGTGGGC GCBTTCBGGG TGCGCGCCB GBBGTGGCT CCGCGCBGCT GCBGGBCBC CBTGBBGGGC
CBGCGTGGG GCCGCGCTCG CCGGCCCCC BCBTCTCCG BGGCBGCGC GGTGCCCCC BGCBCBBGG CCGCBGGGC
BCBGGCBGG BGCBCGCGB GTCGCGGCC GBGGTCTBT GTGGGCTGG GGCTCCGGG TCTTGCCCC TCCGTGCTGG
TGGGCTGGG GTCGCGGG TCTTGCCCC TCCGTGCCG GTGGGCGCG GCTCGCCGC CCCCCCTGC CGGTGGGCT
CCGCGCGCG GCCGCGCTCG CCGCCCCCTG TGGGTCTGC TGGCCGGTC CGGTCCCGG GGTGGGGCG CGBGTGCGG
- 25 5'-CCG BGGGTG-3' (FRAG. NO:1784) (SEQ ID NO:11166)
- 5'-GG TGG GGC-3' (FRAG. NO:1785) (SEQ ID NO:11167)
- 5'-G GGG CCG-3' (FRAG. NO:1786) (SEQ ID NO:11168)
- 5'-GGC CGG GTC CGG G-3' (FRAG. NO:1787) (SEQ ID NO:11169)
- 5'-TGG TGG GGC TGG GGC TCC GGG GTC TCT GCC CCT CCG TGC-3' (FRAG. NO:1195) (SEQ ID NO:10573)
- 30 5'-CGC GTG GGG CCG CGC TCG CCG GCC CCC C-3' (FRAG. NO:1196) (SEQ ID NO:10574)
- 5'-CCT GCC GGG TGG GCT CCC GCC GCG-3' (FRAG. NO:1197) (SEQ ID NO:10575)
- 5'-CGC CGG CCT GCC GGC CCC TC-3' (FRAG. NO:1198) (SEQ ID NO:10576)
- 5'-GTG GGT CCT GCT GGC CGG GTC CGG GTC CCG GGG GTG GGG-3' (FRAG. NO:1199) (SEQ ID NO:10577)
- 5'-CGC GGG TCG GCG GCC GBG GGT C-3' (FRAG. NO:1200) (SEQ ID NO:10578)
- 35 5'-GGGCTCCCGC CGCGBBGGT TBTGGGCTCC CBGGBCBCC CGCBCCGCGC GGBCGTTTBC BTTCGCCBCG CBGTGCGCGG
CCGBCBTGBC GBBGTGGGC GCBTTCBGGG TGCGCGCCB GBBGTGGCT CCGCGCBGCT GCBGGBCBC CBTGBBGGGC
CBGCGTGGG GCCGCGCTCG CCGGCCCCC BCBTCTCCG BGGCBGCGC GGTGCCCCC BGCBCBBGG CCGCBGGGC
BCBGGCBGG BGCBCGCGB GTCGCGGCC GBGGTCTBT GTGGGCTGG GGCTCCGGG TCTTGCCCC TCCGTGC-3'
(FRAG. NO:1788) (SEQ ID NO:11170)

Human Neutrophil Oxidase Factor Nucleic Acid and Antisense Oligonucleotide Fragments

- 40 5'-CGGGBGTGGG GTCTCTGBC GGCBCGTBBG GCBTCCBGG CTCCCTCCB GTCCTTCTG TCCGCTGCCB GCBCCCTTC
BTTCBGBGG CTGCTGCGCT CCBCCBGGG CBTGBTTBG TBGGBCTBG GBGGCCGCC TCCBCCBGG BCBTGTCTCT
TCTGTCCG GTCTCTCTG GGGTTTCGG TCTGGTGGG CTTCCTCTT GGGGCTGCTG CTGGGCTCTT CTTTGTGTT
CTGGCTGCT GTCTCTCTG GCCTTCC TGGGTTCT TGTTTTGT GCCTCCBCC BGGBCBTG-3' (FRAG. NO:1789) (SEQ
ID NO:11171)
- 45 5'-CGGGBGTGGG GG-3' (FRAG. NO:1790) (SEQ ID NO:11172)
- 5'-GCCBGCBCCC-3' (FRAG. NO:1791) (SEQ ID NO:11173)
- 5'-C CBC CBG-3' (FRAG. NO:1792) (SEQ ID NO:11174)
- 5'-GGC CTC CBC CBG GGB CBT G-3' (FRAG. NO:1201) (SEQ ID NO:10579)
- 50 5'-GTC CTT CTT GTC CGC TGC C-3' (FRAG. NO:1202) (SEQ ID NO:10580)
- 5'-TCT CTG GGG TTT TCG GTC TGG GTG G-3' (FRAG. NO:1203) (SEQ ID NO:10581)
- 5'-GCT TTC CTC CTG GGG CTG CTG CTG-3' (FRAG. NO:1204) (SEQ ID NO:10582)
- 5'-GGC TCT TCT TTT TGT TTC TGG CCT GGT G-3' (FRAG. NO:1205) (SEQ ID NO:10583)
- 5'-CTC TCT CGT GCC CTT TCC-3' (FRAG. NO:1206) (SEQ ID NO:10584)
- 55 5'-CTT GGG TGT CTT GTT TTT GT-3' (FRAG. NO:1207) (SEQ ID NO:1216)
- 5'-GGC CTC CBC CBG GGB CBT G-3' (FRAG. NO:1208) (SEQ ID NO:10586)
- 5'-CGGGBGTGGG GTCTCTGBC GGCBCGTBBG GCBTCCBGG CTCCCTCCB GTCCTTCTG TCCGCTGCCB GCBCCCTTC
BTTCBGBGG CTGCTGCGCT CCBCCBGGG CBTGBTTBG TBGGBCTBG GBGGCC-3' (FRAG. NO:1793) (SEQ ID NO:11175)

Human Cathepsin G Nucleic Acid and Antisense Oligonucleotide Fragments

- 60 5'-CCCTCCBCT CTGCTCTGBC CTGCTGGBCT CTGGBTCTG BGTBCGCCB TGTBGGGGCG GGBGTGGGC CTGCTCTCC
GGCTCCCBT GBTCTCCCT GCCTCBGCC CBGTGGGTG BGGBBGGCC BGCBBBGC BGGGTGGCTG CBTCTTCTT
GGTGGGCTT GCTCTCCCG CCTCCGTGT TTGCTGGGT TTTCCCGTC TCTGGTCTG CTTCGGGGT CGT-3' (FRAG.
NO:1794) (SEQ ID NO:11176)
- 5'-GGBGTBCGCC-3' (FRAG. NO:1795) (SEQ ID NO:11177)
- 65 5'-CBGCCCCBG-3' (FRAG. NO:1796) (SEQ ID NO:11178)
- 5'-TCC CGT CTC TGG-3' (FRAG. NO:1797) (SEQ ID NO:11179)
- 5'-GTG GGG CCT GCT CTC CCG GCC TCC G-3' (FRAG. NO:1209) (SEQ ID NO:10587)
- 5'-TGT GTT GCT GG GTT TTT TCC CGT CTC TGG-3' (FRAG. NO:1210) (SEQ ID NO:10588)
- 5'-TCT GCC TTC GGG GGT CGT-3' (FRAG. NO:1211) (SEQ ID NO:10589)
- 70 5'-CCCTCCBCT CTGCTCTGBC CTGCTGGBCT CTGGBTCTG BGTBCGCCB TGTBGGGGCG GGBGTGGGC CTGCTCTCC
GGCTCCCBT GBTCTCCCT GCCTCBGCC CBGTGGGTG BGGBBGGCC BGCBBBGC BGGGTGGCTG-3' (FRAG. NO:1798)
(SEQ ID NO:11180)

Human Defensin 1 Nucleic Acid and Antisense Oligonucleotide Fragments

- 5'-CCGGGGGCTGC BGCBBCTCB TCBGCTCTTG CCTGGBGTGG CTCBGCTGG GCCTGCBGGG CCBCCBGGBG BBTGGCBGCB
BGGBTGGCB GGGTCTCBT GGCTGGGGT BCBGCTCCT TBGCTBGGCB GGGTBCCBG BGBGGG GGG TCC TCB TGG CTG
GGG GCC TGG GCC TGC BGG GCC GCT CTT GCC TGG BGT GGC TC GCC CBG BGT CIT CCC TGG T GCTCAGCCTC
CAAAGGAGCC AGGCTCTCCC CAGTTCCTGA AATCCTGAGT GTTGCTGCC AGTCGCCATG AGAACTTCCT ACCTCTGCT
5 GTTACTCTC TGCTTACTTT TGTCTGAGAT GGCCTCAGGT GGTAACTTTC TCACAGGCCT TGGCCACAGA TCTGATCATT
ACAATTGGGT CAGCAGTGA GGGCAATGTC TCTATTCTGC CTGCCGATC TTTACCAAAA TTCAAGGCAC CTGTTACAGA
GGGAAGGCCA AGTGCTGCAA GTGAGCTGGG AGTGACCAGA AGAAATGACG CAGAAGTGAA ATGAACCTTT TATAAGCATT
CTTTAATAA AGGAAAATTG CTTTGAAGT AT CTGAGTGGT AAAAAGATT TATATCTGCT GTTTGATGAA TGCAGCACCC
ACTAGCCACA TAGTGCTCGT GAGCACTTGC AATGCGGCTA GGGTGATTTC AATTAACCTA AAAGAGAACA GCCACAGGGA
10 GCATGTGGCT GCCATATTGG ATGCTGCTGC TTTGAGAACA AAATGAGAGA AATGAAGCCT CTATTACCT TGGTTGGCGG
AACACATTGA AGGACTCTG TATTGATACC AGGCTTCAAA CTTTGGGAAG TGTACTGGCC AACTTAAACA CATCCACAGG
AGAATGAAGA GGTGGGGA GGGACCAGAA ACCAGGCATT GAGGACAATG AGAAGAGTTT TTCAAAAGTG GAATTACTGC
AAAAAGTGGA AAAATAGCCT TTGGATGGAA GTTACTGATG AGACAATTTC CATCGGTGTG AAAGCCATCT TTCCAAACAGA
GATCTGCAAC ATGAGAATGT ACTGTCTCCT AGGGTACGGA TGGCCTCTTG TATTAGTCCG CTCAGGCTAC CAGATTATC
15 GTTTAACTG CCCATAAACA GACCAGGCAG TTTAAACAAC AGAAATTTAT TTCCTGCGAG TCCTGGAGGC AGGAAGTCTG
CGATCAAGGT GGAAGCAGGG TTGGCTTCTT CTCAGGTGTC TGCTCTTGGC TGGTAGATGA CCGCGCCTC CCTGGGTCTC
CATATGGTCT TCCTCTGTG TGTCTCTGC CCAATCTCTT CTTATAAGGA TGCAAGTCTT ATGATCAGA GCACACCCA
ATGACCGTGT TTAACCTGAA TCACCTCTTT AAAGTTTCTC TCTCCAAATA CAATCACCTC CTGAGGCACT GTTAGGGCTT
CGACACAGGA ATCTTTTCC TAGGGGATTC AGTTCAGTCC AAAACGCTA CCAGTGGAGA CTTGCAACAT GCGCGCCTGC
20 TGGTCCCTCG CCAGGAATAT CACAGGCGAC TGTCCCTGT TGCATGGAAT AGAAGGCTAT TCCAGAGTAC TGTCTTATT
TATCAGATCT GGGATACTGG GAGAAGGGCA AAATAAAGTC GAGTAGAGAA AAAAACTAT GAAAGTTTGA GAGAGTAACC
ATAATTTTCA CCCGATGTGA AACGATCCTA GATTTCAGCT GAAATAGTGA TGTGGGAAGT GAGGGGGCGG GGATTCAAGG
CAGAGGGAAC AGCGTAATC AAGGCATGGA AGGAGGGAAG TGTAGGCTGT GTTGAAGAG TGGCAGCTGC TTCCACATT
CTAAACACA GAGTGTGATT TTGGGGTGTG TTGAGACAA GCAGAAAAC TGTTTGGAAA AATAACTTGA ATTCCTGCA
25 CATTTAAAT CTCTCAGCAG AAGAAAACCC CACTCAGAAC CCCACTGTTC ATTCCTTGGC TGTATTGG SCACAGCTGG
CATAGCCCCA GACTGAGTAA GCTCTTCA GACCTCATTT CATGAGTAGC CCCAAAGATC AATCATGGGC CAATTTCTGT
GAAGAGAAGA CTCTCCGCTG TTTTGCAGTT ATTTGTCTG CTCTCCGAG ATGTTCTCAA ATCGTTGACG TTCCAAACGA
TGAGTCTGAA GTGTTTGTG TCCTCTTCA CAGGTGGTAA CTTTCTCACA GGCCTTGGCC ACAGATCTGA TCATTACAAT
TGCGTCAGCA GTGGAGGGCA ATGCTCTAT TCTGCTGCC CGATCTTAC CAAAATCAA GGCACCTGT ACAGAGGGAA
30 GGCCAAAGTG CCAGAGTGAG CTGAGAGTGA CCAGAGAA TGACGAGAA GTGAAATGAA CTTTATAA GCATCTTTT
AATAAAGGA AATTGCTTTT GAAGTATACC TCCTTGGGC CAAAATGAAT CTTGTGCTC AATTGGAAGA GGTAAAGAAG
TAGGGGGTTA GGTGCAATGG GTTGAACGT GAGACAGGTC GAACCAAAA GCCTGCTGG AAAAGGGGAG TGACGTCTA
GGCTTCAGGT ATGTACCTC CACTTTGTTT GATCCACAAA CCAACAGGTG ACTGATTTT GTGAGCTCAG CCTCCAAAGG
AGCCAGCCTC TCCCAAGTTC CTGAAATCCT GAGTGTGTC TGCCAGTGC CATGAGAACT TCCTACCTTC TGCTGTTTAC
35 TCTCTGCTTA CTTTGTCTG AGATGGCTC AGGTGGTAAC TTCTCACAG GCCTTGGCCA CAGATCTGAT CATTACAATT
GCGTCAGCAG TGGAGGGCAA TGTCTTATT CTGCTGCTC GATCTTACC AAAATTCAG GCACCTGTA CAGAGGGAAG
GCCAAGTGCT GCAAGTGAGC TGGAGTGAC CAGAAGAAAT GACGAGAAG TGAAATGAAC TT -3' (FRAG.NO:1799) (SEQ ID
NO:12379)
- 5'-GTGAGCTCAG CCTCCAAAGG AGCCAGCCTC TCCCAAGTTC CTGAAATCCT GAGTGTGTC TGCCAGTGC CATGAGAACT
40 TCCTACCTTC TGCTGTTTAC TCTCTGCTTA CTTTGTCTG AGATGGCTC AGGTGGTAAC TTCTCACAG GCCTTGGCCA
CAGATCTGAT CATTACAATT GCGTCAGCAG TGGAGGGCAA TGTCTTATT CTGCTGCTC GATCTTACC AAAATTCAG
GCACCTGTTA CAGAGGGAAG GCCAAGTGCT GCAAGTGAGC TGGAGTGAC CAGAAGAAAT GACGAGAAG TGAAATGAAC TT-
3' (FRAG.NO:) (SEQ ID NO:11844)
- 5'-CTGCACTGGT AAAAAGATT TATATCTGCT GTTTOATGAA TGCAGCACCC ACTAGCCACA TAGTGCTCGT GAGCACTTGC
45 AATGCGGCTA GGGTGAATTC AATTAACCTA AAAGAGAACA GCCACAGGGA GCATGTGGCT GCCATATTGG ATGGTGTCTG
TTTGAGAACA AAATGAGAGA AATGAAGCCT CTATTACCT TGGTTGGCGG AACACATTGA AGGACTCTG TATTGATACC
AGGCTTCAAA CTTTGGGAAG TGTACTGGCC AACTTAAACA CATCCACAGG AGAATGAAGA GGTGGGGA GGGACCAGAA
ACCAGGCATT GAGGACAATG AGAAGAGTTT TTCAAAAGTG AATTAATCTG AAAAAAGTGA AATAAGCCT TTGGATGGAA
GTTACTGATG AGACAATTTC CATCGGTGTG AAAGCCATCT TTCCAACAGA GATCTGCAAC ATGAGAATGT ACTGTCTCT
50 AGGGTAGCGA TGGCCTCTTG TATTAGTCCG CTCAGGCTAC CAGATTATC GTTTAAACTG CCCATAAACA GACCAGGCAG
TTTAAACAAC AGAAATTTAT TTCTCGCAG TCCTGGAGGC AGGAAGTCTG CGATCAAGGT GGAAGCAGGG TTGGCTCTT
CTCAGGTGTC TGTCTTGGC TGGTAGATGA CCGCCGCTC CCTGGGCTC CACATGGTCT TCTCTCTGTG TGTCTCTGTC
CCAATCTCTT CTTATAAGGA TGCAAGTCTT ATGGATCAGA GCACACCCCA ATGACCGTGT TTAACCTGAA TCACCTCTTT
AAAGTTTCTC TCTCCAAATA CAATCACCTC CTGAGGCACT GTTAGGGCTT CGACACAGGA ATCTTTTCC TAGGGGATTC
55 AGTTCAGTCC AAAACGCCTA CCAGTGGAGA CTTGCAACAT GCGCGCCTGC TGGTCCCTCG CCAGGAATAT CACAGGCGAC
TGTTCCTGT TGCATGGAAT AGAAGGCTAT TCCAGAGTAC TGTCTTATT TATCAGATCT GGGTACTGAG GAGAAGGGCA
AAATAAAGTC CAAGTAGAAA AAAAACTAT GAAAGTTTGA GAGAGTAAAC ATAATTTCAG CCCGATGTGA AACGATCCTA
GATTTCAGCT GAAATAGTGA TGTGGGAAGT GAGGGGGCCG GGAATCAAGG CAGAGGGAAC AGCGTAACTG AAGGCATGGA
AGGAGGGAAG GTTAGGCTGT GTTGAAGAG TGGCAGCTGC TTCCACATTT CTAAACACA GGATGTGATT TTGGGGTGTG
60 TTGAGACAAG CCAGAAAAC TGTGGGAAA AATAACTTGA ATCCCTGCA CATTAAAAAT CTCTCAGCAG AAGAAAACCC
CACTCAGAAC CCCACTGTTC ATTCCTTGGC TGTATTGG SCACAGCTGG CATAGCCCCA GACTGAGTAA GCTCTTCA
CACCTCATTT CATGAGTAGC CCCAAAGATC AATCATGGGC CAATTTCTG GAAGAGAAGA CTCTCCGCTG TTTTGCAGTT
ATTTGTCTG CTCTCCGAG ATGTTCTCAA ATCGTTGCA CTACAAGCCA TGAGTCTGAA GTGTTTGTGT TCCTCTCTTA
CAGGTGGTAA CTTTCTCACA GGCCTTGGCC ACAGATCTGA TCATTACAAT TGCGTCAGCA GTGGAGGGCA ATGCTCTAT
65 TCTGCTGCC CGATCTTAC CAAAATCAA GGCACCTGT ACAGAGGGAA GGCCAAAGTG TGCAAGTGAG CTGAGAGTGA
CCAGAGAAGA GTACGAGAA GTGAAATGAA CTTTATAA GCATCTTTT AATAAAGGA AATTGCTTT GAAGTATACC
TCCTTGGGC CAAAATGAAT CTTGTGCTC AATTGGAAGA GGTAAAGAAG TAGGGGGTTA GGGTGCATGG GTTGAACGT
GAGACAGGTC GAACCAAAA GCCTGCTGG AAAAGGGGAG TGACGTCTA GGCTCAGTG ATGTACCTC CACTTTGTTT
GATCCACAAA CCAACAGGTG ACTGATTG-3' (FRAG.NO:) (SEQ ID NO:11843)
- 5'-GCTCAGCCTC CAAAGGAGCC AGCCTCTCCC CAGTTCCTGA AATCCTGAGT GTTGCTGCC AGTCGCCATG AGAACTTCCT
70 ACCTCTGCT GTTACTCTC TGCTTACTTT TGTCTGAGT GGCCTCAGGT GGTAACTTTC TCACAGGCCT TGGCCACAGA
TCTGATCAIT ACAATTGCGT CAGCAGTGA GGGCAATGTC TCTATTCTG CTGCCGATC TTTACCAAAA TTCAAGGCAC
CTGTTACAGA GGAAGGCCA AGTGCTGCAA GTGAGCTGG AGTGACCAGA AGAAATGACG CAGAAGTGAA ATGAACCTTT
TATAAGCATT CTTTAAATAA AGGAAAATTG CTTTGAAGT AT-3' (FRAG.NO:) (SEQ ID NO:11841)
- 5'-CCGGGGC-3' (FRAG.NO:1800) (SEQ ID NO:11182)

- 5'-GG GCCTGCBGGG CC-3' (FRAG.NO:1801) (SEQ ID NO:11183)
 5'-GGCBGCB BGG-3' (FRAG.NO:1802) (SEQ ID NO:11184)
 5'-GGG TCC TCB TGG CTG GGG-3' (FRAG. NO:1212) (SEQ ID NO:10590)
 5'-GCC TGG GCC TGC BGG GCC-3' (FRAG. NO:1213) (SEQ ID NO:10591)
 5'-GCT CTT GCC TGG BGT GGC TC-3' (FRAG. NO:1214) (SEQ ID NO:10592)
 5'-GCC CBG BGT CTT CCC TGG T-3' (FRAG. NO:1215) (SEQ ID NO:10593)
 5'-CCGGGGGCTGC BGCBCCTCB TCBGCTCTTG CCTGGGTGG CTBCGCTGG GCCTGCBGGG CCBCCBGBG BBTGGCBGCB
 BGGBTGGCGB GGGTCTCTCBT GGCTGGGGT CCBGBTCTC TBGCTBGGCB GGGTGBCCBG BGBGGGC-3' (FRAG.NO:1803)
 (SEQ ID NO:11185)
- 10 **Human Defensin 2 Nucleic Acid and Antisense Oligonucleotide Fragments**
 5'-ATCCTTTAAG TCAATGGACT TTGCATCAGT CACACCATCT TTTGTTACTT TGGACTTCCC CAGCTATGTT CAATAATTAC
 TGTTCCTCCC TTGGGCCCA TTGTAATGGC TACAGCCTCG AAAAAAAGTC TACACTTTGA AGCAITTAAG CTCGGACATC
 AGCACCAAT TTTACATCTT TACCATCACT TCAAGTGAGG TGAGGAGCCA GTAGCCTGGA CACTGGTCTC ATCTGGTGAA
 AGACTGTGG TAATGGAAGC ATTTCTGTGG GGTGCTGGCA GGACATGTGC ATGGCGAGGC AGGTTCATCAG CAGCAAGTGA
 15 GAGCTGCCCT TTACTTTCTA AAGGTGACAT AGCAAAATATA CAAAAAATAA TAAATAAATT ATTAATTTAG GTAGAGCACA
 TAAAGGCTTT ATTTATATT CCATTTCTCT GTATGCTTTC TTCACCAGGA AGAAATAGTT TTAGTGTGAG GAATGAATGA
 GTCTGCCCT CAATTCAGC CTGCTCAACA CACAAGGAAA CAAAGCCCTG ACAATCAGAG TGACTCCCTG GTGACTAAGC
 TCCCAGTCTT GGATGCATAT TTGTTTAGCA GTTCTGACAG CATTTGACCC AGCCCTCTCT CTGCATATCC CATCAGAACCC
 TTCTTTTTTT TTTTTTCTT TGAGACTGAG TCTTGCTCTG TCGGAAGCGA CTCCTGTGCC TCAGCCTCCC AAATACCTGG
 20 AATTATAGGC GTAAAGCCATC ATGCTCTGGT AATTTTGTGA TTTTTCATGG AGATGGGGTT TTGCCATGTT GGTCAAAATG
 GTCTACACCT CCGACCTCA TGTGATCCAC TGCTCTGAC CTGCCCTGAG CTCCTCAAACT GCTGGGATGA CAGGTGTAAG CCACCATGCT
 AGGCTCAGAA ATTTCTTTT ATAAAAATGT CATTAAGGAT CTGGGCTGCA CAATATCGTT ACCAGCTTCC TTTAAATCCA
 CTCTGGCCT GCCAGGAATC AGGTCTTCA GAACCTGACA TTTTAAATGA AGAGGTGAGG CAGTTCATGA GGAAGGCCTC
 ATTGTCCTC TGCTCTGTC ACTGCTGAC CCTGAGACA TCACAGACAT GGACACTGGG GCCTGCTGT TTCTCAAACT
 25 GCGCTTAGAT CGAAAGAGGG AGGAACCAGG ATGAATGCCA CTCATTTTCC CAAGAAAGGC CCTCTCTGA GTGCCCCGGA
 TGGGGCTCTG TCCATGCTCT GGGGCCGCCA ATTGCTACT TGGTTACGG AGGAAGGACA GGGTCTGAG AGACACCAGA
 GACCTCACAC AGCCTGAAA ACATGGGGCT CCTTCAATG TGTTCCTCAT CACCAACAGG GAGACCAGT GGAGGCCTTG
 CAGCCCCACT CGGTGCTCT CCACCAATC CCAAGGGCAG TGACGCTGAC GTCTGTGGA AGCAGAGAAA GCCCTGGCTC
 CCAAAGCCCT GAAGTCCCTG TGGAGCTGAC ATTCCTGAG TGACGGTGTG AATGGAAGGA ACTCAAGTGC GGGTGGTAGG
 30 CCACCTCCTG GCCAGGCCT GGTGAACTC TGAGGGGACA CATGTAGTCA CAATCCATC CTCCATCTC CTTCTCAGA
 GGAAGGAAGT GGGCATCCAT TGCCTCATC TCTCTCCGT GGGGAAGATG GGGAGTTTCA GGGGAACCTT CACATAAATT
 TCACAGCTC AGATCTCTG TGAGGATGGG GCCCACCATG CTCCTGGTGC TGCCAGAGGC CCTGAGCCCC TCCAGGGTCT
 CCTGGGTTT AGCCAGCCCT GTATCATCCC CAGGAGCTGA ATGCAGAGC AATGGATAGA ATTAGATGGA AAGAGCTCTC
 AATTGACCT GAGACTGTCC CCAGATATC AGGAAAAACA AGACGTGCGA CAGAGTGGG CAGAGGTGAG TGGCAGGTTA
 35 TAGGTCTGA GTTTGAGTT GTTCTCACGT GAGACAGAC CAGCCCTCA CTCCATTCAC ACATGGGTT TAAATGGTG
 CAAGATAGGA GCAATTTTCT GGTCCCAAGA GCAGGAGGAA GGGATTTTCT GGGGTTTCT GAGTCCAGT TTGCATAAGA
 TCTCTGAGT GTGCAATGTT CTITGAGGAC CATCTCTGA CTCACAGGT AAGTGGCTGA ATTCTAACCT CTGTAATGAG
 CATTGCAACC AATACCAGTT CTGAATCTTA CCTGGTGACC AGGGACAGG ACCTTTATAA GGTGGAAGGC TTGATGCTCT
 CCCCAGACT AGCTCCTGGT GAAGCTCCCA GCCATCAGC ATGAGGCTCT TGTATCTCT CTTCTGTTT CTTCTCATAT
 40 TCCATGATGCC TCTTCCAGGT GAGATGGGCC AGGGAATAG GAGGGTTGGC CAAATGGAAG AATGGCGTAG AATGCTCTG
 TCTCTCTCA TTCCCTCCA CCTATCTCT CCTCATCCT CTCTCTCTT CCTCTCTG TGTGTCCCT CCATCCTTT
 CTCTGCTTC TCTCTCTCT TCCCTCTCT TCTTTTCTT GTCTTTCTT TCTCTCTCT CCTAGAGCAT GTCTTTCTT
 CTTCTCTTT CTTTCTTCT ACCCAGCTT TTAGACTGAA TGCCCTATT AATTGAACAA AATGAGCTT CTTCTCATAG
 AAAAGGAGTT TGAGAACCA ATGGACACT CACTGCTCT TCTAAGCCAA TATGAAGGAG CCCAGTAGCT TGTAAATATC
 45 ATCTCTTAC TGCTTTCCAT GCTACAATG CTGAGACTAT GGTGAAACC TGTAGGTGA CTTTTAAAT AAAAGGCAGA
 AATTTGATT TTATCTAAAG AAAGTAGTAT AGAATGTGAT TTCTTAAAT TTTATATTA AAGGGTAGAT ATGCAACCT
 AGAGAATTC AGATAATCTT AAGGCCAGC CTATACTGTG AGAACTACTG CAGCAAGACA CTCTGCTCC AGGACTTTTC
 TGATCAGAG CCCTGAGAAC AGTCCCTGCC ACTAGGCCAC TGCAGGTCA CAGGACAGG TACAGCCAT TGAAACCTAC
 TTTTAAACCT GGATGCCCTA CCTTCATTT CTCTTGATA TTATGAAAT AAAATAAAAA CCAATGAAAG AATAAAGAGG
 50 GAGAGTGGAA GGAAGGATG GAGAAAGGA AAAAGAAAT TTGAGAGTAA ATCCTAAAC AATTAATCTA ATAGATATCA
 TCTTGTAAT TCTCATTTT ACCAATCTTA TTTATGAGT CTGGGTTTTG TGAGAACAAT GGGGTTCTGA GAGGCCAG
 AGACCTCATG TTTTCAAAA CCTAGAACAG TATAATGAG GAAGGCGGG AGGCAGGGAG GCGAGGAGG AGGGAGGAG
 GGAGGCCGGC AGGTGGGGAG GGAGGACGG AAGGAGGAG GGAGGAGGG AGGGAGGGAG GGAGGATAA AAAAAGAAGA
 ATGAGGTGA AACCAGGACT TAGATATTAG AAACAAGCCA TTACAAAAT TATTCTATG GTTAATTGTG GTTTTCACT
 55 GTAAGTTACT TGGTGTAAAT TTCCTATTAA ACAATTTTCA TAAGTTGCAT CTTTATATCC CATCTCAGGT CAAATACCTA
 ACAGACTAAA TGAITGAAA AAGCAAAAGT TACTGGCTT GTGTGTGTTA AAATGGAGGT ATGGTGGCTT TGATATTATC
 TTCTGTGGT GGAGCTGAAT TCACAAGAGA TCGTTGCTGA GCTCTACCA GACCCACCT GGAGGCCCA GTCACTCAGG
 AGAGATCAGG GTCTTTTACA ATCAGGTCT ACAAATAAAT ACATCCCCC AACCACAGCA GTGCCAGTTT CCATGTCTGA
 AACTAGATC CAAATGACTG ACTCGCTCT CATTATCATG ATGAAAAAGC CCAGGCTTGA GAAAGAAGCC CGCTGCGGAT
 60 TTACTCAAG CGATACTGAC ACAGGGTTTG TGTTTTCCA ACATGAGTT TGAGTTCTTA CACGCTGTT GCTTTTTT
 TGTGTTTTT CCCTGTIAGG TGTTTTGGT GGTATAGGG ATCCTGTIAC CTGCCITTAAG AGTGGAGCCA TATGTCATCC
 AGTCTTTTGC CTAGAAAGT ATAAACAAAT TGGACCTGT GGTCTCCCTG GAACAAAATG CTGCAAAAAG CCATGAGGAG
 GCCAAGAAGC TGCTGTGGCT GATGCGGATT CAGAAAGGGC TCCCTCATCA GAGACGTGCG ACATGTAAC CAAATTAAC
 TATGGGTGCC AAAGATACGC AATCTTTATC CTAGTAATG TGGTCAATGG GTGATGTTGG TTTGGGAGG CCATCTCTAA
 65 TATCCTTGAA ACACCTTTT CTGCTCTCCA GGAAGGGGTC AGGGCTGCCA CAGCGGGGCT TGGAGTGCTT TCCAGGGTCA
 CAGGCATCTG TATCTTTGG ATTCCTTGAC CTTCCTCAT TATTCCTGCG ATTTCTCTAA AACGTGTGCT TTGCTCTTCC
 TGCATCTCC CTCTGATGC CCTCACATC CCCATCTCT CCCTAAAAAA AGCAAGCCCA ACTCAAGAC CAGTCCCTC
 ATGGAATCAT AGTGGATCTG CCAAGGAGG GATGCCCCG TCTCTGTTT TTCACAAGAC TCCCTCTTC TGGCTAAGGT
 TCTTATGCA ATTATGAATCAT TCTCACCTT TTGATGTAT AAGAAAGTAT GGAGAAATAT ATCCTCTATC AATTTTCAAT
 70 GCTTCAATA ATTTCTAAT CATCAGTCA TGTTTTCCA TCTTTTACT TGATGATGCC CTTTCTTCA ACCTTTTCA
 TTGCATCAGA GATGATGTTA CCAATTTCTT TGTCTCCATT TGCAGAAAT GTAGCAACCT GTGCAATTC TTCAGGTTG
 GTCACAGGT TAGACTGCTT TTTAAGTTCA GCAATTCAG CATCAACAGC TAACATCACA CCTCTCTGTA TTCCACTGG
 ATTAGACTT TTGCTAACCT TCTGGAAGGC TTTATTTGAA ATAGAGCAT CAGTACAGC AGCAGTGATA GTGCATCCC
 CCACTCTCTC CATTGTGTT ATTGGCAACA TCTTGGACAA GTTAGCTCC AATGCTTTA TATTTATCT TTAAGTCAAT
 75 TGACTTTGCA TCAGTCACAC CATCTTTGT TACTTTGGGA CTTCCTCAGC TATGTTCAAT AATTACTGTT CTTCCTTTG

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GCCCATTTGT AATGGCTACA GCATCGACAA AAAAGTCTACA CTTTGAAGCA TTAAGGCTCA GACATCAGCA CCAAAATTTTA
CATCTTTACC ATCACTTCAA GTGAGGTGAG GAGCCAGTAG OCTGGACACT GGTCTCATCT GGTGAAAGAC TGTGGGTAAT
GGAAGCATTT CTGTGGGOTG GTGGCAGGAC ATGTGCATGG TGAGGCAGGT CATCAGCAGC AAGTGAGAGC TGCCTCTTAC
TTTCTAAAGG TGACATAGCA AGTATACAAA AAAAAATAAA ATATTAATTT AGGCAGAGCA CATAAAGGCT TTATTTTCATA
TTCCATTCT CTGATGCTT TCTTCACCA GAGAAATAG TTTTAGTGTC AGGAATGAAT GAGTCTGCCC CTCAATTCOA
GCCTGCTCAG CACACAAGGA AACAAAAGCCC TGACAATCAG AGTGACTCCC TGGTGACTAA GCTCCAGTCC TGGATGCATA
TTTGTITAGC AGTTCGTACA GCATCTGACC CAGCCCTCTC TTTCGATACC CCACCAGAAC CTTCITTTIT TTITTTTTTC
TTTGAGACTG AGTCTTGCTC TGTCGGAAGC GATTCCGCTG CCTCAGCCTC CCAAATACCT GGAATTATAG GCGTAAGCCA
TCATGCCTGG CTAATTTTTG TATTTTTTAT GGAGATGGGG TTTTGCCATG TTGGTCAAAT TGGTCTCACA CTCTGACCT
CATGTGATCC ACCTGCCTCA GCCTCCCAAA GTGCTGGGAT GACAGGTGTA AGCCACCATG CTAGGCTCAG AAATTTCTCT
TTATAAAAT GTCATTAAGG ATCTTGGCTG CACAATATCG TGAAGAGGTC AGGCAGGTCA TGAGGAAAGC CTCATTGTCC CCATGTCTCT
TCAGGGTTCT TCAGAACTCG ACATTTTAAA TGAAGAGGTC AGGCAGGTCA TGAGGAAAGC CTCATTGTCC CCATGTCTCT
GTCACTGTCT CACCCCTGAG ACATCACAGA CATGGACACT GGGGCTGTCT TGTTCCTCAA ACTGCCCTTA GATCGAAAGA
GGGAGGAACC AGGATGAATG CCACTCATTT TCCCAAGAAA AGCCCTCTCC TGAGTGCCCG GGTATGGGCT CTGCAATTTG
CCTGGGGCCG CCAATTGCTA CTCTGGGTTA CGGAAGAAAG ACAGGGTCTC GAGAGACACC AGAGACCTCA CACAGCCCTG
AAAACATGGG GCTCCTTCAT AAGTGTITTC CATCAACAAC AGGGAGACCA CGTGAGGCC TTGCAAGCCCT ACTCGGTGCT
TCTCCACCAA ATCCCAAGGG CAGTGACGCT GACGTCTGTG GAAAGCAGAG AAAGCCCTGG CTCCCAAAGC CTGCAAGTCC
TGTGAGCTG AGTACCTCGT AGTGACGGTG TGAATGGAAG GAACCTCAAG GCGGGTGGTA GGCCACCTCC TGGCCAGGCC
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Human Defensin 3 Nucleic Acid and Antisense Oligonucleotide Fragments
 5'-CGCTGCBBTC TGCTCCGGGG CTGCBGCBBC CTCTCBGCTC TGCCGTGGBGTG GCTCBGCTGG GCCTGCBGGG
 CCBCCBGBGB BTGGCBGBGB GBTGGCBGBGG TCCTCBTGGC TGGGTCBCTC GGBGBGGGB GGBGBGGGG TCCTCBTGGC
 TGGGTCCTC CTCTCCCGTC CT CCACTTGC TATAGAAGAC CTGGGACAGA GGACTGCTGT CTGCCCTCTC TGGTCACTC
 75 GCCTAGCTAG AGGATCTGTG ACCCAGCCA TGAGGACCTT CGCCATCCTT GCTGCCATTC TCCTGGTGGC CTGCAAGGCC

- CAGGCTGAGC CACTCCAGGC AAGAGCTGAT GAGGTTGCTG CAGCCCCGGA GCAGATTGCA GCGGACATCC CAGAAGTGGT
TGTTCCTCTT GCATGGGACG AAAGCTTGGC TCCAAAGCAT CCAGGCTCAA GGAAAAACAT GGAAGTCTAT TGCAGAATAC
CAGCGTGCAT TGCAGGAGAA CGTCGCTATG GAACCTGCAT CTACCAGGGA AGACTCTGGG CATTCTGCTG CTGAGCTTGC
AGAAAAAGAA AAATGAGCTC AAAATTGCTT TTGAGAGCTA CAGGGAATTG CTATTACTCC TGTACCTTCT GCTCAATTTC CTTT-
3' (FRAG. NO:1804) (SEQ ID NO:12382)
- 5'-CCTACCTTGC TATAGAAGAC CTGGGACAGA GGACTGCTGT CTGCCCTCTC TGGTCAACCT CCCTAGCTAG AGGATCTGTG
ACCCAGCCA TGAGGACCTT CGCCATCCTT GCTGCCATTG TCCTGGTGGC CTGCAAGGCC CAGGCTGAGC CACTCCAGGC
AAGAGCTGAT GAGGTTGCTG CAGCCCCGGA GCAGATTGCA GCGGACATCC CAGAAGTGGT TGTTCCTCTT GCATGGGACG
AAAGCTTGGC TCCAAAGCAT CCAGGCTCAA GGAAAAACAT GGAAGTCTAT TGCAGAATAC CAGGCTGCAT TGCAGGAGAA
10 CGTCGCTATG GAACCTGCAT CTACCAGGGA AGACTCTGGG CATTCTGCTG CTGAGCTTGC AGAAAAAGAA AAATGAGCTC
AAAATTGCTT TTGAGAGCTA CAGGGAATTG CTATTACTCC TGTACCTTCT GCTCAATTTC CTTT-3' (FRAG. NO:) (SEQ ID
NO:11847)
- 5'-GAATTCCTCTG TAAGCCCTGT TACAGGGGCT GCACCCCAAGA TACAACCTGA CCTGTGTCCA AGGCGGGCAA CTCAACCTT
AGATATTGAA TGGGTCCCAT GGCACCAATG CTTAAACACC AGCAGCCCTC ACAACCCACAG ATCGTGTITT AAGGATGAGG
15 AGGTAGTTCT CTGGATGCAC AGGCTTCAAT CCAAAATGGGC TCATGACGCC GCAGCACACA CCCAGTCTGC AGCCTGAAGA
GTTGGAGCAT TGCATTACA GAAAGCATCC AGACATGATC ATGGGCTCAG GGATACACCT GTTCTCCGAT GTGTACCAT
GAAGGATGGA AACTCTATG CCTCCAGAA AGCACCCTC AAGCTTTTGC TGAATGCTTC TCTGAAGGCC CACAAGGCTG
AGAGGCTGTG CAACACCAGC AGTAAAGTGA ATGCCAGAC TCCACCTCC TTTCTTGGGT GGCCATCTGG AAAGGCCACT
CCCACCTGA TGGCTAATGC CTCAGACCAG TTCTTGGCCC AGATGATCCT AGACAATTGT TTAAGCTTAA ACTGTTTCA
20 GGCCAAAGCAA ACAGGTGATA GTACCTCTGG GGAACACATC GCCGCGTGTA CATCCAGATC TCAGGAAGAAC CCAAAATGT
CTGTTCACCA TAGCAACAGA AGCCCAAGTA GCACCTCAGT TCACCTGGGT GTTCTCCAAC ATCCAGCTC AGCCAAATGG
CTTTCATTAG TTTTATGGT TAGACCCAG GTCTCTGGGA CACTGCTTTA GAAACACATT CCAAATCCTC CTCTGTGTGC
AGGTGGCAIT CCTATCCCAA TCTCTTTGCA GGGCGTATAC TGTGATACGC AGCCAGGCTG TCCAGAGGC CTTAAATATT
CCCITGGTGC AGGTAGTTCA GCTTAGCCAC AGCCAATGCA TCACAGGGTC AACTGTGTGA GGAGCCATTG AGAATCCATA
25 GTTGGTTGCT GCCTGGGCTT GGCCAGGGCT GACCAAGTGA GATGAGAGGT TCCTCTGTGG AGTTCTACTT TAACCTCACC
TTCCACCAA ATTCTCAAC TCTCTTTGCA ACCACAATTA TTTAATGGAC CCAACAGAAA GTAACCCGGC AAATTAGGAC
ACCTCATCCC AAAAGACCTT TAAATAGGGG AAGTCCACTT GTGACCGGT GCTCCTGTCT ATAGAAGACC TGGGACAGAG
GACTGCTGTC TGGCCTCTCT GGTCAACCTG CCTAGCTAGA GGATCTGTAA GTACTACAAA ACTTAAACTT TACACTGAGT
TTTCATCAT GAAGCTATGC CTCCAATCTG ACCTCTGACT GTGGGGCCGC CCCAGAGGGA CCCAGCGGT GAATCCCTGC
30 TAGGAACGTC TGTCCGACC TCTGGTACT GCTGGGACG ATGGCTTCCA GCTAACTTAA TAGAGAACT CAAGCAGTTT
CCTTCTAAAT ACACATGTCA CATGTCTGTG TTGACATGTC CAGTAAGAAG ACTATCACAG GTCTTTGGAA CATCTTTTGG
AGAGAAACCT ATTTAGTTC TTGGTCTGTT TTCAATCAG GTTGTGTGAT TTTGTCTATT TTTGTCTATT AATTCCTTAT
GTATTCAGAT ATTTGCCCT TCTGCCATGT AGGTTTTCGA AATATTTTCT CTCATTTTCT GGGTTATCTT TCACTCGGT
TGATTTGTTT CTGTGTGTG CAGATGTCTT AGCGTAAAT GAAGCCACAC TTGCTATTT TCCCTTTTAT TGCTGTGTC
35 TTTGGTGTC TAGCCAAGAA ATCATTACCT ACATCAATGT CAAAAGCTTT ATCCTTCTAT ACACCTCTAG TAGTTTATGG
TTTCAGTTGT TACATTTAGG TTTTCAATTC ATTCTGAGT GATGTTCTTA CATGGTGTGA GATAAAGATT TAAATACATA
CATATATAAA ATCATGAGGT AGTGTACACT ATAAATATAC AATTGTTAAT TGTACTCAA GTCTAAGTAG AGGTGGAAT
AATAAATCT CTTTITTTTA CTTAAACCACT TCTGTGACT TGAGCTGAT TCACCTTAG CTGTATAAAA TCATTGTCT
CTCCACCCTG ATTCTACAG GAGACTACTC ACCCCATAAC CTCAAAAACC TCTTCATGAG GATGGTAAGT CACCTGAATC
40 CTGAAGTGAA TTACTCGCTA TTCCATTGGA ACTCATATAG GACACCAGAA TCTAGACCTC CAGAGAACAG CAGGACCCAT
CTTCAGAAAA TAAGAAGCAT TTGTTCCTG AGCCTGTTGA ATCAAAGTGC AATTCTTATT CTTTITGGAA TTTTAAAAAG
TGAATCATAA TATTAAGCA GGTGAACCA CGAGTAACAT AGCAGGGTCT TTCTGTGAT TATTAGCTCC AACCTAGCAC
AGACATTAAG GGTACAGATG TATACTAGCA TGAACCTGGG AGAACAGGAG CATTCGAGCA ACCTTGAGAC CAATGGGCTC
CTCTATAAAT ATGCACACCT CCTCTCACTG AGATTGAGGA AGGTTTCTTG TCTCCGAGCC TTCTCCCATG AGAGCTATAA
45 ATCCAGGCTG GCTCCTCCTC CCCACACAG CTGCTCCTGC TCTCCTCCT CCAGGTGACC CCAGCCATGA GGACCCTCGC
CATCCTTGCT GCCATTCTCC TGGTGGCCCT GCAGGCCAG GCTGAGCCAC TCCAGGCAAG AGCTGATGAG GTTGCTGCAG
CCCCGGAGCA GATTGCAGCG GACATCCAG AAGTGGTTGT TTCCCTTGCA TGGGACGAAA GCTTGGCTCC AAAGCATCCA
GGTGAGAGAG GCAGGCATGC AGAGCTGCTA AGTCTAGAGG GAAGGACGGG AGAGAGGTTT CAGAGTTGGG TCTCAGCAGT
CTATGTCACT GAGGTGGCTT CACTTAGAAT CTCTGGGCTT TGATTTTCTC ATCTAGAAAT TGAACAGAGA GCCAAATAAA
50 CCTGAGAAAA TTTATTCTC CAAAGACTTG ATTCCAAGAA ACATCTGTGA AATTCATAA GTTTAAGATA TGAAGATAGA
GACTAGTTAT TTCTGGATCT AAACAAGTAG ACTTAGTTGT AAAGAGAACA TTTTACTCTA TCTACAGAAG AGCTTTTAAA
AACTGCAGCC AAGCCTGAGG GTAAGTTTCTG GTGTGTGTGT GATGGGGCAG GAATGCAAAA ATGAGAGCAA AGGAGAATAG
GTCTCAAAT CTGTGTGACA AGCACTGCTC TGCCTGTGTTA TTCTATCGA CTGAGGTTGT TCGTGCTACC GGCTGCAATG
CAGCCAGCAT CACCTGTGAG CTAGCATGTG ACTTCCCCGA GATTCTTTT CTTACCCACT GCTAACTCCA TACTCAATTT
55 CTCTGCTCT CCTGTCCCA GGCTCAAGGA AAAACATGGA CTGCTATTGC AGAATACCAG CGTGCATTGC AGGAGAACGT
CGCTATGGAA CCGTGCATCTA CCAGGGAAGA CTCTGGGCTT TCTGCTGCTG AGCTTGCGA AAAAGAAAAA TGAGCTCAAA
ATTGCTTTG AGAGCTACAG GGAATTGCTA TTAATCTGCT ACCTTCTGCT CAATTTCTT TCCTCATCTC AAATAAATGC
CTGTTTACAA GATTTCTGTG TTTCCACCTC TTAATGTGT GATATGTGTC TGTGTCAAGA CACTTGGGAT ACACGTACCA
AAACGCAAAA TCAAAATTTT GAACAATATA-3' (FRAG. NO:) (SEQ ID NO:11846)
- 5'-GGCBGCBGG-3' (FRAG. NO:1805) (SEQ ID NO:11187)
5'-GG CTG GGG-3' (FRAG. NO:1806) (SEQ ID NO:11188)
5'-GGGGTCBCC-3' (FRAG. NO:1807) (SEQ ID NO:11189)
5'-GGG TCC TCB TGG CTG GGG TC-3' (FRAG. NO:1216) (SEQ ID NO:10594)
5'-CCT CTC TCC CGT CCT-3' (FRAG. NO:1217) (SEQ ID NO:10595)
- 65 5'-CGCTGCBBTC TGCTCCGGG CTGCBGCBBC CTCTCBGCTC TTGCTGGBGTG GCTCBGCTGG GCCTGCBGGG
CCBCCBGGGB BTGGCBGCBGG GTGTCBGGG TCCTBTGGC TGGGTCBCTT GGBGGBGGGB GBGCBGG-3' (FRAG.
NO:1808) (SEQ ID NO:11190)

Human Macrophage Inflammatory Protein-1-alpha/RANTES

Receptor Nucleic Acid and Antisense Oligonucleotide Fragments

- 70 5'-GTCTTTGTTT CTGGGCTCGT GCCCBTCCC GGCTTCTCTC TGGTCCGCTC CTCTGTGGTG TTTGGCCCTG CTTCTTTTGG
CCTGTTGAGG GGGCAGCAGT TGGGCCCCAA AGGCCCTCTC GTTACCTTC TGGCAGGAGTT GCATCCCCATA GTCAAACCTC
GTGGTCTGT CATAGTCTC TGTGGTGTIT GGAGTTTCCA TCCCGGCTC TCTGTGTTT CAAGGGAGB GGGGCBGCB
TTGGGCCCC BBBGGCCCTC TCGTTCBCT TCTGGCBGCG BTGTGCBTCC CCBTGTGCB BCTGTGTGT CGTGTCTBTG
TCCTCTGTGG TGTGTTGGBT TTCCBTCCC GCTTCTCTCT GTTCCBBGG GB-3' (FRAG. NO:1809) (SEQ ID NO:11191)

5'-GGGCC CC-3' (FRAG. NO:1810) (SEQ ID NO:11192)
5'-GGGGGCGBCG-3' (FRAG. NO:1811) (SEQ ID NO:11193)
5'-CCCGGCTTC-3' (FRAG. NO:1812) (SEQ ID NO:11194)
5'-GTC TTT GTT TCT GGG CTC GTG CC-3' (FRAG. NO:1218) (SEQ ID NO:10596)
5'-CCB TCC CGG CTT GTC TCT GGT TCC-3' (FRAG. NO:1219) (SEQ ID NO:10597)
5'-GTC CTCTGT GGT GTT TGG-3' (FRAG. NO:1220) (SEQ ID NO:10598)
5'-CCC TGC TTC CTT TTG CCT GTT-3' (FRAG. NO:1221) (SEQ ID NO:10599)
5'-GAGGGGGCAG CAGTTGGGCC CCAAGGCCCTCTCTGTTAC CTCTGGCAC GGAGTTGCAT CCCCATAGTC AAACCTCTGTG
GTCGT-3' (FRAG. NO:1222) (SEQ ID NO:10600)
5'-GTCATAGTCCCTCTGTGGTGTGGAGTTTCCATCCCGGCTTCTCTCTGTTTCCAAGGGA-3' (FRAG. NO:1223) (SEQ ID NO:10601)
5'-GBGGGGGCBG CBGTTGGGCC CCBGGGCCCTCTCTGTTCCB CTCTGGCBC GGBGTGCBT CCCCBTGTGCT BBBCTCTGTG
GTCGTG-3' (FRAG. NO:1224) (SEQ ID NO:10602)
5'-TCBTGTCTCTGTGGTGTGGGTTCCTCCCGGCTTCTCTCTGTTCCBGGGB-3' (FRAG. NO:1225) (SEQ ID NO:10603)
RANTES Antisense Oligonucleotide Fragments
5'-GGGCBGCGGG CBGTGGGCGG GCBBTGTBGG CBBGCBGCB GGGTGTGGTG TCCGBGGBBT BTGGGGBGGC BGBTGCBBG
GCGCBGGBG CBGTGCBBT GBGGTGBCB GCGGGGCGTG CCGCGGBGC CTCTBTGTGCT CCTGTGGGBG GGCTGTGGBG
GGGGGTGTGG TGTCCGCTTG GCGGTCTTT CGGGTGTTC TTCTCTGGGT TGGCTGTGCT CTCGTCTGGT CGCTCCGCTC
CCGGGTTCGT CTCGCTCTGT CGCCCTTCC TTCCTGTGCT TGTTCTCTCC TTCCTGCTCT-3' (FRAG. NO: 1813) (SEQ ID
NO:11195)
5'-GGGTGGC-3' (FRAG. NO: 1814) (SEQ ID NO:11196)
5'-CGGG CBG-3' (FRAG. NO: 1815) (SEQ ID NO:11197)
5'-CCCGGTTTCG-3' (FRAG. NO: 1816) (SEQ ID NO:11198)
5'-GGGTGTGGTG-3' (FRAG. NO: 1817) (SEQ ID NO:11199)
5'-GGGCBGCGGG CBGTGGGCGG GCBBTGTBGG CBBGCBGCB GGGTGTGGTG TCCGBGGBBT BTGGGGBGGC BGBTGCBBG
GCGC-3' (FRAG. NO:1226) (SEQ ID NO:10604)
5'-BGBGGGCBGTB GCBBTGBGG TBGCBGCGBG CGGTGCCGCG GBGBCCTTCB TGTBCTCTGT GGBGBGGCTG TCGBGGG-3'
(FRAG. NO:1227) (SEQ ID NO:10605)
5'-GGGTGTGGTGTCCGCTTGGCGGTCTTTCGGGTGTTTCTCTCTGTTGTCGCTGCTGCTGCTGCTGCTG-3' (FRAG. NO:1228) (SEQ
ID NO:10606)
5'-GCTCCGCTCCCGGGTTCGTCTGCTCTGTGCGCCCTTCCTTCCTTGTGCTGTTCCTCCCTTCCTTGCCTCT-3' (FRAG. NO:1229)
(SEQ ID NO:10607)
5'-GGGTGTGGTGTCCG-3' (FRAG. NO:1230) (SEQ ID NO:10608)
5'-CTTGGCGGTTCTTTCGGGTG-3' (FRAG. NO:1231) (SEQ ID NO:10609)
5'-TTTCTCTCTGGGTTGGC-3' (FRAG. NO:1232) (SEQ ID NO:10610)
5'-CTGCTGCTCTGCTGTTGTC-3' (FRAG. NO:1233) (SEQ ID NO:10611)
5'-GCTCCGCTCCCGGGTTC-3' (FRAG. NO:1234) (SEQ ID NO:10612)
5'-GTCTCGCTCTGTGCGCC-3' (FRAG. NO:1235) (SEQ ID NO:10613)
5'-CTTCTCTCTGTGTC-3' (FRAG. NO:1236) (SEQ ID NO:10614)
5'-GTGTTCTCTCTCTCTTCTGCTCT-3' (FRAG. NO:1237) (SEQ ID NO:10615)
5'-GGGCBGCGGG CBGTGGGCGG GCBBTGTBGG CBBGCBGCB GGGTGTGGTG TCCGBGGBBT BTGGGGBGGC BGBTGCBBG
GCGCBGGBG CBGTGCBBT GBGGTGBCB GCGBGCGTG CCGCGGBGC CTCTBTGTGCT CCTGTGGBG GGCTGTGGBG GG-3'
(FRAG. NO:1818) (SEQ ID NO:11200)
Human Muscarinic Acetylcholine Receptor HM1 Nucleic Acid and Antisense Oligonucleotide Fragments
5'-GCTGCCCGGC GGGGTGTGCG CTTGGCGCTC CGTGCTCGG TTCTCTGTCT CCGGTCCCC CTTCCTTGGC GTCTCGGGCC
TTCGTCTCT TCTCTTCTT CTTCCGCTC CGTGGGGCT GCTTGGTGGG GGCTGTGCT CCGGTCCCC GGGCTTCTGG
CCCTTCCGT TCATGTGGC TAGGTGGGC GTTCTGTGCT GCTBGGTGG GC-3' (FRAG. NO:1819) (SEQ ID NO:11201)
5'-GGTGGGGC-3' (FRAG. NO:1820) (SEQ ID NO:11202)
5'-GCCCGCGGGG-3' (FRAG. NO:1821) (SEQ ID NO:11203)
5'-CGG GGC TTC TGG CCC-3' (FRAG. NO:1822) (SEQ ID NO:11204)
5'-GTT CBT GGT GGC TBG GTG GGG C-3' (FRAG. NO:1238) (SEQ ID NO:10616)
5'-GCT GCC CGG CGG GGT GTG CGC TTG GC-3' (FRAG. NO:1239) (SEQ ID NO:10617)
5'-GCT CCG GTG CTC GGT TCT CTG TCT CCC GGT-3' (FRAG. NO:1240) (SEQ ID NO:10618)
5'-CCC CCT TTG CCT GGC GTC TCG G-3' (FRAG. NO:1241) (SEQ ID NO:10619)
5'-GCC TTC GTG CTC TTC CTC TTC TTT CC-3' (FRAG. NO:1242) (SEQ ID NO:10620)
5'-GCT CCG TGG GGG CTG CTT GGT GGC GGC CTC TGC CTC GGG GTC C-3' (FRAG. NO:1243) (SEQ ID NO:10621)
5'-CGG GGC TTC TGG CCC TTG CC-3' (FRAG. NO:1244) (SEQ ID NO:10622)
5'-GTT CAT GGT GGC TAG GTG GGC C-3' (FRAG. NO:1245) (SEQ ID NO:10623)
Human Muscarinic Acetylcholine Receptor HM3 Nucleic Acid and Antisense Oligonucleotide Fragments
5'-GGG GTG GGT BGG CCG TGT CTG GGGTT GGC CBT GTT GCT TGC CTCT TGG TGG TGC GCC GGG CCGT TCT GTT TCT
TCT CCT TCG GGC CCT CGG GCC GGT GCT TGT GGCT CCT CCC GGG CGG CCT CCC CGG GCG GGG GCT TCT TGGCG CTG
GCG GGG GGG CBT CTTGCT CTG TGG CTG GGC GTT CCT TGG TGT TCT GGT TGGTGG CGG GCG TGT TGG CTT TGGGG
CCC GCG GCT GCG GGG GTTG CTT GTC TGC TTC GTCTT TGC TGT CCT CCC GGG CCG CCGGG GTG GGT AGC CCG TGT CTG
GGGGTT GGC CAT GTT GGT TGC CCGG CCC GCG GCT GCA GGG G-3' (FRAG. NO:1823) (SEQ ID NO:11205)
5'-CCC GGG CGG-3' (FRAG. NO:1824) (SEQ ID NO:11206)
5'-G CCG GGG GGG CC-3' (FRAG. NO:1825) (SEQ ID NO:11207)
5'-CCC GGG CCG CC-3' (FRAG. NO:1826) (SEQ ID NO:11208)
5'-GG CCG TGT-3' (FRAG. NO:1827) (SEQ ID NO:11209)
5'-GGG GTG GGT BGG CCG TGT CTG GGG-3' (FRAG. NO:1246) (SEQ ID NO:10624)
5'-GTT GGC CBT GTT GGT TGC C-3' (FRAG. NO:1247) (SEQ ID NO:10625)
5'-TCT TGG TGG TGC CCG GGG C-3' (FRAG. NO:1248) (SEQ ID NO:10626)
5'-GCG TGT TGG CTT TCT TCT CCT TCG GGC CCT CGG GCC GGT GCT TGT GG-3' (FRAG. NO:1249) (SEQ ID NO:10627)
5'-GCT CCT CCC GGG CGG CCT CCC CGG GCG GGG GCT TCT TG-3' (FRAG. NO:1250) (SEQ ID NO:10628)
5'-GCG CTG GCG GGG GGG CCT CCT CC-3' (FRAG. NO:1251) (SEQ ID NO:10629)
5'-GCT CTG TGG CTG GGC GTT CTT TGG TGT TCT GGG TGG C-3' (FRAG. NO:1252) (SEQ ID NO:10630)

- 5'-TGG CGG GCG TGG TGG CCT CTG TGG TGG-3' (FRAG. NO:1253) (SEQ ID NO:10631)
 5'-GGG CCC GCG GCT GCB GGG G-3' (FRAG. NO:1254) (SEQ ID NO:10632)
 5'-TTG CCT GTC TGC TTC GTC-3' (FRAG. NO:1255) (SEQ ID NO:10633)
 5'-CTT TGC GCT CCC GGG CCG CC-3' (FRAG. NO:1256) (SEQ ID NO:10634)
 5'-GGG GTG GGT AGG CCG TGT CTG GGG-3' (FRAG. NO:1257) (SEQ ID NO:10635)
 5'-GTT GGC CAT GTT GGT TGC C-3' (FRAG. NO:1258) (SEQ ID NO:10636)
 5'-GGG CCC GCG GCT GCA GGG G-3' (FRAG. NO:1259) (SEQ ID NO:10637)
- Human Fibronectin Antisense Oligonucleotide Fragments**
- 5'-CGG TTT CCT TTG CGG TC TTG GCC CGG GCT CCG GGT G CCC GCC CGC CCG CCG GCC GCC GC CCC GCC GGG CTG TCC
 10 CCG CCC GCG CCC GGC CCG GGG CGC GGG GG CCG CCC TCC CGC CCC TCT GG GCC GGC GCG GGC GTC GG CCG CTC GCG
 CCT GGG GTT CCC TCT CCT CCC CCT GTG C GCC TGC CTC TTG CTC TTCTGC GTC CGC TGC CTT CTC CC CTC TCC TCG GCC
 GTT GCC TGT GC TGT CCG TCC TGT CGC CCT TCC GTG GTG C TGT TGT CTC TTC TGC CCT C GGT GTG CTG GTG CTG GTG
 GTG GTG CCT CTG CCC GTG CTC GCCCTG CCT GGG CTG GCC TCT TCG GGT GTG GCT TTG GGG CTC TCT TGG TTG CCC TTT
 CTT CTC GTG GTG CCT CTC CTC CCT GGC TTG GTC GT TGT CTG GGG TGG TGC TCC TCT CCC TTT CCC TGC TGG CCG TTT GT
 15 CTT GTT TTC TGT TGT CCT CT TTC CTC CTG TTT CTC CGT TTG GCT TGC TGC TTG CGG GGC TGT CTC C CTT GCC CCT GTG
 GGC TTT CCC TGG TCC GGT CTT CTC CTT GGG GGT C GCC CTT CTT GGT GGG CTGGCT CGT CTG TCT TTT TCC TTC C TGG
 GGG TGG CCG TTG TGG GCG GTG TGG TCC GCC T TGC CTC TGC TGG TCT TTC-3' (FRAG. NO:1828) (SEQ ID NO:11210)
 5'-GGCCCGGGC-3' (FRAG. NO:1829) (SEQ ID NO:11211)
 5'-GCCGGCGCGGGCG-3' (FRAG. NO:1830) (SEQ ID NO:11212)
 5'-GCCTGGGCTGGCC-3' (FRAG. NO:1831) (SEQ ID NO:11213)
 5'-GGGGG TGGCCG-3' (FRAG. NO:1832) (SEQ ID NO:11214)
 5'-GG GGG TGG CCG TTG TGG GCG G-3' (FRAG. NO:1833) (SEQ ID NO:11215)
 5'-CGG TTT CCT TTG CGG TC-3' (FRAG. NO:1260)(SEQ ID NO:10638)
 5'-TTG GCC CGG GCT CCG GGT G-3' (FRAG. NO:1261)(SEQ ID NO:10639)
 25 5'-CCC GCC CGC CCG CCG GCC GCC GC-3' (FRAG. NO:1262)(SEQ ID NO:10640)
 5'-CCC GCC GGG CTG TCC CCG CCC CGC CCC-3' (FRAG. NO:1263)(SEQ ID NO:10641)
 5'-GCC CCG GGG CGC GGG GG-3' (FRAG. NO:1264)(SEQ ID NO:10642)
 5'-CGG CCC TCC CGC CCC TCT GG-3' (FRAG. NO:1265)(SEQ ID NO:10643)
 5'-GCC GGC GCG GGC GTC GG-3' (FRAG. NO:1266)(SEQ ID NO:10644)
 30 5'-CCG CTC GCG CCT GGG GTT CCC TCT CCT CCC CCT GTG C-3' (FRAG. NO:1267)(SEQ ID NO:10645)
 5'-GCC TGC CTC TTG CTC TTC-3' (FRAG. NO:1268)(SEQ ID NO:10646)
 5'-TGC GTC CGC TGC CTT CTC CC-3' (FRAG. NO:1269)(SEQ ID NO:10647)
 5'-CTC TCC TCG GCC GTT GCC TGT GC-3' (FRAG. NO:1270)(SEQ ID NO:10648)
 5'-TGT CCG TCC TGT CGC CCT TCC GTG GTG C-3' (FRAG. NO:1271)(SEQ ID NO:10649)
 35 5'-TGT TGT CTC TTC TGC CCT C-3' (FRAG. NO:1272)(SEQ ID NO:10650)
 5'-GGT GTG CTG GTG CTG GTG GTG-3' (FRAG. NO:1273)(SEQ ID NO:10651)
 5'-CCT CTC CCC GTG CTC GCC-3' (FRAG. NO:1274)(SEQ ID NO:10652)
 5'-CTG CCT GGG CTG GCC TCT TCG GGT-3' (FRAG. NO:1275)(SEQ ID NO:10653)
 5'-GTG GCT TTG GGG CTC TCT TGG TTG CCC TTT-3' (FRAG. NO:1276)(SEQ ID NO:10654)
 40 5'-CTT CTC GTG GTG CCT CTC CTC CCT GGC TTG GTC GT-3' (FRAG. NO:1277)(SEQ ID NO:10655)
 5'-TGT CTG GGG TGG TGC TCC TCT CCC-3' (FRAG. NO:1278)(SEQ ID NO:10656)
 5'-TTT CCC TGC TGG CCG TTT GT-3' (FRAG. NO:1279)(SEQ ID NO:10657)
 5'-CCT CGT TGC TGT CTT CCT CT-3' (FRAG. NO:1280)(SEQ ID NO:10658)
 5'-TTC CTC CTG TTT CTC CGT-3' (FRAG. NO:1281)(SEQ ID NO:10659)
 45 5'-TTG GCT TGC TGG TTG CGG GGC TGT CTC C-3' (FRAG. NO:1282)(SEQ ID NO:10660)
 5'-CTT GCC CCT GTG GGC TTT CCC-3' (FRAG. NO:1283)(SEQ ID NO:10661)
 5'-TGG TCC GGT CTT CTC CTT GGG GGT C-3' (FRAG. NO:1284)(SEQ ID NO:10662)
 5'-GCC CTT CTT GGT GGG CTG-3' (FRAG. NO:1285)(SEQ ID NO:10663)
 5'-GCT CGT CTG TCT TTT TCC TTC C-3' (FRAG. NO:1286)(SEQ ID NO:10664)
 50 5'-TGG GGG TGG CCG TTG TGG GCG GTG TGG TCC GCC T-3' (FRAG. NO:1287)(SEQ ID NO:10665)
 5'-TGC CTC TGC TGG TCT TTC-3' (FRAG. NO:1288)(SEQ ID NO:10666)
- Human Interleukin-1 (IL-1) Nucleic Acid and antisense Oligonucleotide Fragments**
- 5'-AAGCTTCTAC CCTAGTCTGG TGCTACACTT ACATTGCTTA CATCCAAGTG TGGTTATTTC TGTGGCTCCT GTTATAACTA
 TTATAGCACC AGGTCTATGA CCAGGAGAAT TAGACTGGCA TTAATCAGA ATAAGAGATT TTGCACCTGC AATAGACCTT
 55 ATGACACCTA ACCAACCCCA TTATTACAA TTAACAGGA ACAGAGGGAA TACTTTATCC AACTCACACA AGCTGTTTTT
 CTCCAGATC CATGCTTTTT TCGGTTTATT ATTTTTTAGA GATGGGGGCT TCACTATGTT GCCCACACTG GACTAAAACT
 CTGGGCCCTCA AGTGATTTGC CTGCCTCAGC CTCCTGAATA GCTGGGACTA CAGGGGGCATG CCATCACACC TAGTTTCATTT
 CCTCTATTTA AAATATACAT GGCTTAACT CCAACTGGGA ACCCAAAACA TTCAATTGCT AAGAGTCTGG TGTTCTACCA
 CCTGAAGTAG GCTGGCCACA GGAATTATAA AAGCTGAGAA ATTCTTTAAT AATAGTAACC AGGCAACATC ATTGAAGGCT
 60 CATATGTAAA AATCCATGCC TTCTTTTCTC CCAATCTCCA TTCCCAAACT TAGCCACTGG TTCTGGCTGA GGCCCTACGC
 ATACCTCCCG GGGCTTGCAC ACACCTTCTT CTACAGAAGA CACACCTTGG GCATATCCTA CAGAAGACCA GGCTTCTCTC
 TGGTCTTGG TAGAGGGCTA CTTTACTGTA ACAGGGCCAG GGTGGAGAGT TCTCTCTGA AGCTCCATCC CCTCTATAGG
 AAATGTGTTG ACAATATTCA GAAGAGTAAG AGGATCAAGA CTTCCTTGTG CTCAAATACC ACTGTTCTCT TCTCTACCCT
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 65 GGCTCATTTT CCCTCAAAAG TTGCCAGGAG CTGCCAAGTA TTCTGCCAAT TCACCCTGGA GCACAATCAA CAAATTCAGC
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 45 **Human Interleukin-1 Receptor (IL-1 R) Nucleic Acids and Anti-sense Oligonucleotide Fragments**
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 30 AGATGGTCTG ACTGTGCTAT GGCCTCATCA TCAAGACTTT CAATCTATC CCAAGTGAAA TAAATGGAAT GAAATAATTC
 AAACACAAAA AAAAAAAGAA AAAAAAAG-3' (FRAG. NO. 11887) (SEQ ID NO: 11887)
 5'-GCCGAGCGG ACTCGGAGCG CGCGGCGCGG CCGGGAGGAG CCGAGCGCGC CGGGCGCGGC GTGGGGGCGC CGGCTGCCCC
 GCGCGCCAG GGAGCGGCGG GAATGTGACA ATCGCGCGCG CGCACCGTAA CACTCCTCGC TCGGCTCTCA GGGCTCTCGC
 CCTCTGAGCT GAGCCGGGTT CCGCCCGGGC TGGGATCCCA TCACCTTCCA CGGCCGTCCG TCCAGGTAGA CGCACCTCT
 35 GAAGATGGTG AGTCCCTCTT GAGAAGCTGG ACCCCTTGGT AAAAGACAAG GCCTTCTCCA AGAAGAATAT GAAAGTGTTA
 CTCAGACTTA TTTGTTTCAT AGCTCTACTG ATTTCTTCTC TGGAGGCTGA TAAATGCAAG GAACGTGAAG AAAAAATAAT
 TTTAGTGTA TCTGCAATG AAATTGATGT TCGTCCCTGT CCTCTTAAAC CAAATGAACA CAAAGGCACT ATAACITGGT
 ATAAAGATGA CAGCAAGACA CCGTATCTA CAGAACAAGC CTCAGGATT CATCAACACA AAGAGAAACT TTGTTTGTG
 CCTGCTAAGG TGGAGGATTC AGGACATTAC TATTGCGTGG TAAGAAATTC ATCTTACTGC CTCAGAATTA AAATAAGTGC
 40 AAAATTGTG GAGAATGAGC CTAACCTATG TTATAATGCA CAAGCCATAT TTAAGCAGAA ACTACCCGTT GCAGGAGACG
 GAGGACTGT GTGCCCTTAT ATGGAGTTTT TAAAAATGA AAATAATGAG TTACCTAAAT TACAGTGGTA TAAGGATTG
 AAACCTCAT TTCTTGACAA TATACACTT AGTGAGATCA AAGATAGGCT CATCGTGATG AATGTGGCTG AAAAGCATAG
 AGGGAACAT ACTTGTCTAT CATCCTACAC ATACTTGGGC AAGCAATATC CTATTACCCG GGTAATAGAA TTTATTACTC
 TAGAGGAAAA CAAACCCACA AGGCCTGTGA TTGTGAGCCC AGCTAATGAG ACAATGGAAG TAGACTGGG ATCCCAGATA
 45 CAATTGATCT GTAATGTAC CGGCCAGTTG AGTGACATTG CTCTCTGGA GTGGAATGGG TCAGTAATTG ATGAAGATGA
 CCCAGTGCTA GGGGAAGACT ATTACAGTGT GGAAAAATCT GCAACAAAAA GAAGGAGTAC CCTCATCACA GTGCTTAATA
 TATCGGAAAT TGAAAGTAGA TTTTATAAAC ATCCATTAC CTGTTTGGC AAGAATACAC ATGGTATAGA TGCAGCATAT
 ATCCAGTTAA TATATCCAGT CACTAATTT CAGAAGCACA TGATTGGTAT ATGTGTACAG TTGACAGTCA TAATTGTGTG
 50 TTCTGTTTT ATCTATAAAA TCTTCAAGAT TGACATTGTG CTTTGTGACA GGGATTCTCT CTATGATTTT CTCCCAATAA
 AAGCTTCAGA TGGAAAGACC TATGACGCAT ATATACTGTA TCCAAAGACT GTTGGGGAAG GGTCTACCTC TGAAGTGTGAT
 ATTTTGTGT TTAAGTCTT GCCTGAGGTC TTGAAAAAAC AGTGTGGATA TAAGCTGTTT ATTTATGGAA GGGATGACTA
 CGTTGGGGA GACATTGTTG AGGTCAATTA TGAAAAAGCA AAGAAAGTAT TATCATTTTA GTCAGAGAAA
 CATCAGGCTT CAGCTGGCTG GGTGGTTCAT CTGAAGAGCA AATAGCCATG TATAATGCTC TTGTTCAAGG TGAATTTAAA
 GTTGTCTCTG TTGAGCTGGA GAAAATCCAA GACTATGAGA AAATGCCAGA ATCGATTAAA TTCATTAAGC AGAAACATGG
 55 GGCTATCCGC TGGTCAGGGG ACTTTACACA GGGACCACAG TCTGCAAGAA CAAGGTTCTG GAAGAATGTC AGGTACCACA
 TGCCAGTCCA GCGACGGTCA CCTTCATCTA AACACCAAGT ACTGTCAACA GCCACTAAGG AGAAACTGCA AAGAGAGGCT
 CACGTGCCTC TCGGGTAGCA TGGAGAAGTT GCCAAGAGTT CTTAGGTGC CTCCTGTCTT ATGGCGTTGC AGGCCAGGTT
 ATGCCCTATG CTGACTTGCA GAGTTCATGG AATGTAACATA TATCATCCTT TATCCCTGAG GTCACCAGGA ATCAGG-3' (FRAG.
 NO. 11888) (SEQ ID NO: 11888)
 60 **Human Interleukin-8 Fragments Antisense Oligonucleotide Fragments**
 5'-GTTGTTTGT BCCBBBGBCT CBBGBBTBGC TTTGCTBTCT BBGBTCBCB TTTBGBCBTB GBBBGBCGCT GTBGGTCBGBB
 BGGTGTGCTT BCCTTCBCB BGGCTGCBG BBBTCBGBBGG CTGCBGBBGBG CCBGCGCCBGC TTGGBTCTBT GTTTBCBGB
 BGTBGGTGC TCCGTGGCT TTTGCTTGT GTGCTCTGCT GTCTCTG TTC CTTCGGTGG TTTCTCTCTG GCTCTTGTCC
 TTTCTCTTGG CCCTTGGCCC-3' (FRAG. NO:1834) (SEQ ID NO:11216)
 65 5'-G CTC CGG-3' (FRAG. NO:1835) (SEQ ID NO:11217)
 5'-CBBGBBTBGC-3' (FRAG. NO:1836) (SEQ ID NO:11218)
 5'-CBCBC BTGGBGGTGC-3' (FRAG. NO:1837) (SEQ ID NO:11219)
 5'-BCCBBBGBCT CBBGBBTBGC-3' (FRAG. NO:1838) (SEQ ID NO:11220)
 5'-GCCBBBGBG CCBGCGCCBGC-3' (FRAG. NO:1839) (SEQ ID NO:11221)
 70 5'-GTG CTC GGG TGG CTT TTT-3' (FRAG. NO:1289) (SEQ ID NO:10667)
 5'-GCT TGT GTG CTC TGC TGT CTC TG-3' (FRAG. NO:1290) (SEQ ID NO:10668)
 5'-TTC CTT CCG GTG GTT TCT TCC TGG CTC TTG TCC T-3' (FRAG. NO:1291) (SEQ ID NO:10669)
 5'-TTC TCT TGG CCC TTG GCC C-3' (FRAG. NO:1292) (SEQ ID NO:10670)

5'-GBTGTTTGT BCCBBBGCBT CBBGBBTTGCT TTTGCTBTCT BBGGBTBCBCB TTTBGBCBTB GBBBBCGCT GTBGGTBCGBB
BGBTGTGCTT BCCTTCBCBC BGBGCTGCBG BBBTBCGBBGG CTGCCBBBGBG CCBGCGCCBGC TTGGBGTCTBT GTTTCBCBCB
BGTGBGGTG TCCGGTGGCT TTTTGTGT-3' (FRAG. NO:1840) (SEQ ID NO:11222)

Human IL-8 Receptor Alpha Antisense Oligonucleotide Fragments

- 5 5'-ACAGGGGCTG TAATCTTCATC TGCAGGTGGC ATGCCAGTGA AATTTAGATC ATCAAAATCC CACATCTGTG GATCTGTAAT
ATTGACATG TCCTCTTCAG TTTCAGCAAT GGTTGATCT AACTGAAGCA CCGGCCAGGB CBGGGGCTGT BBTCTTCBTC
TGCBBGGTGC BTGCCBGTGB BBTTTBGTC BTCBBBTTCC CBCTCTGTG GBTCTGTBBT BTTTGBCBTG TCCTCTTCBG
TTTCBGCBB TGGTTTGTG TBBCTGBBGC BCCGGCCBGG TGGCTCGGTG CTCTGCCCC TGTGTGTGCG GCGCTCGGTT
GGTGTGCCCC CTGTGGTGCT TCGTTTCCCC CTCCTTCTCT TTGTTCGGGG GTTCTGTGTG CGGGCTGCTT GTCTCGTTCC-
- 10 3'(FRAG.NO:1841)(SEQ ID NO:11223)
5'-CBGGGGC-3' (FRAG. NO:1842) (SEQ ID NO:11224)
5'-GCBGGTGGC-3' (FRAG. NO:1843) (SEQ ID NO:11225)
5'-GCGGGCGCTC-3' (FRAG. NO:1844) (SEQ ID NO:11226)
5'-TGGCTCGGTGCTTCTGCCCC (FRAG. NO:1293)(SEQ ID NO:10671)
- 15 5'-TGTGTTGTGCGGCGCTC (FRAG. NO:1294)(SEQ ID NO:10672)
5'-GGTTGGTGTGCCCCCTG (FRAG. NO:1295)(SEQ ID NO:10673)
5'-TGGTGCTTCGTTTCC (FRAG. NO:1296)(SEQ ID NO:10674)
5'-CCCTCTTCTCTTGTGTTT (FRAG. NO:1297)(SEQ ID NO:10675)
5'-GGGGGTTCTTGTGGC (FRAG. NO:1298)(SEQ ID NO:10676)
- 20 5'-GGGCTGCTTGTCTGTTCC (FRAG. NO:1299)(SEQ ID NO:10677)
5'-ACAGGGGCTG TAATCTTCATC TGCAGGTGGC ATGCCAGTGA AATTTAGATC ATCAAAATCC CACATCTGTG GATCTGTAAT
ATTGACATG TCCTCTTCAG TTTCAGCAAT GGTTGATCT AACTGAAGCA CCGGCCAGG-3' (FRAG. NO:1845) (SEQ ID NO:11227)
5'-B CBGGGGCTGT BBTCTTCBTC TGCBBGGTGGC BTGCCBGTGB BBTTTBGTC BTCBBBTTCC CBCTCTGTG GBTCTGTBBT
BTTTGBCBTG TCCTCTTCBG TTTCBGCBB TGGTTTGTG TBBCTGBBGC BCCGGCCBGG-3' (FRAG. NO:1846) (SEQ ID NO:11228)
- 25 Interleukin-11 (IL-11) Nucleic Acid and Antisense Oligonucleotide Fragments
5'-GCTCAGGGCA CATGCCTCCC CTCCCCAGGC CGCGGCCAG CTGACCCTCG GGGCTCCCC GGCAGCGGAC AGGGAAGGGT
TAAAGGCCCC CGGCTCCCTG CCCCCTGCCC TGGGGAACCC CTGGCCCTGT GGGGACATGA ACTGTGTTTG CCGCTGGTC
CTGGTCGTGC TGAGCTGTG GCCAGATACA GCTGTGCGCC CTGGGCCACC ACCTGGCCCC CTOGAGTTT CCCCAGACCC
TCGGGCCGAG CTGGACAGCA CCGTGCTCT GACCCGCTCT CTCTGGCGG ACACGCGGCA GCTGGCTGCA CAGCTGAGGG
30 ACAAATTCCT AGCTGACGGG GACCACAACC TGGATTCCCT GCCCACCCCTG GCCATGAGTG CCGGGGCACT GGGAGCTCTA
CAGCTCCAG GTGTGCTGAC AAGGCTGCGA GCGGACCTAC TGCTCTACCT GCGGCACGTG CAGTGCTGC GCGGGCAGG
TGGCTCTTCC CTGAAGACCC TGGAGCCCGA GCTGGGCACT CTGACGGCCC GACTGGACCG GCTGCTGCGC CGGCTGCAGC
TCCTGATGTC CCGCTGGCC CTGCCCCAGC CACCCCGGA CCCGCGGCG CCCCCGCTG CCCCCCTC CTCAGCTGG
GGGGGATCA GGGCGGCCA CGCCATCTG GGGGGGCTG ACCTGACACT TGACTGGCC GTGAGGGGAC TGCTGCTGCT
35 GAAGACTCGG CTGTGACCCG GGGCCAAAG CCACACCGT CCTTCCAAAG CCAGATCTTA TTTATTTATT TATTTACGTA
CTGGGGCGA AACAGCCAGG TGATCCCCC GCCATTATCT CCCCCTAGTT AGAGACAGTC CTTCCTGTAG GCTGGGGGA
CATCTGTGCC TTATTTATC TTATTTATTT CAGGAGCAGG GGTGGGAGGC AGGTGGACTC CTGGGTCCCC GAGGAGGAGG
GACTGGGGT CCGGATTCT TGGGTCTCCA AGAAGTCTGT CCACAGACTT CTGCCCTGGC TCTTCCCCAT CTAGGCTGG
GCAGGAACAT ATATTATTTA TTTAAGCAAT TACTTTTCT GTTGGGGTGG GGACGGAGGG GAAAGGGGAA CCGGCTTTT
40 TGTACAAAA TGTGAGAAAC CTTTGTGAGA CAGAGAACAG GGAATTAAT GTGCATACA TATCC CAGCTGCGGC
ATCTCTGTG TCAGAGTCTT GGTGTCTGT TTCTTTTCCC CTGGGGTCT CCCTGGGTCT CCCCAGTCC CTCTGTCTC
CTTCTTCCC CTCTGTATC TCTGACTCC AGAAGCTCTC CTTCTGTCTC CAGGGCTGCC CTTCTGATCC TCTTGTCTC
TCTGGTGTG CTCTCTGGCT GCCTCCATCT CTGTGGATCT CCGTCTCCCT GTCTCTGTCT CAGTCTGTCC TTCACTCTGT
GTGTGTGTG GTCTCTCTCT CTCTCTCTCC TTCCCTTCCA CTCCCTCTTC CTCTGCTC CACCTCTCCA GGGCCCTGT
45 TTGTCCCTCC GTCCGGCCTT TCTCTGCTT TCCGTCTCC TGCTTCCCC TCTCTCTCT CTAGTCTGT CCAGCCGGAC
CCCCACCCAG AGTCGGGCC CAGCGCTGA GAGAGAGTG CTGCTCCGG CCGTGGAGGT GGAGGGAGGG CAGGCCAATG
ACCTACCCAG CCCCTCTCCG ACCACCCCCC CCTTCCCTT TCAACTTTT CCAACTTTT CTTCCTGTC CTCCTCCGAG
CGCGCGCGG TGAGCCCTGC AAGGCAGCCG CTCCCTCTGA ATGGAAGAG CAGGCAGGGA GGGTGTGTC GGATGTGTCA
GGCCGGCCTT CCCCCTGCGC CTGCCCCCG CCGCGCCG CACAGGCGTC CCGAGGCTT CCACTCCCT
50 CACTGCCGCG GGGCCTGTG CTCAGGGCAC ATGCTTCCC TCCCCAGCCG CCGGCCAGC TGACCTCCG GGCTCCCCG
GCAGCGGACA GGAAGGGGT AAAGGCCCC GGTCTCCCTG CCCCCTGCC TGGGAACCCC TGGCCCTGT GGGACATGAA
CTGTAAAGTT GTTCATGGGG AGGGTGGAG GGACAGGAG GCAGGGAGGA GAGGACCCA CCGCGGGGT GGGAGCAGAC
CCCGCTGAGT GCACACAGAG GGGACCCGGA GACAGGAGC CCGGGAGGAG AGCAGCTTCG GAGACAGGAG CCGCGGAGG
AGATGGGAG AGAGAGACAC AGACAGGAGC GGATGGAGG AGCCAATCAG AGGCGCGCA GGAGGACCG GCCAGACAGG
55 CCCCAGAGAG AGCGAGACGC GAGACCGAGC AGGGGACAGG AGCAGGGAC TGGTGGCGG AGGGAGGTGA CCCCATCGA
CCCAGGCCCC AGGGAGCCCG CCGGGAACCG GAGACTCCCT GGGATTCCCG CAGAGAGGCT CCGGAGGGAA ACTGAGGAG
GGTCCGCGGA GAGCGAGCA AGCCAGGAG TAGCGACCCC AGCCGGGGG AGGAGAGAGA CTGGGCGCCG GGGGAAAGCG
GGGAGAGCCG GGCAGATGCG GCCGACGGAG GCGCGGACAG ACCGACGGCT GCGGGGCCG GGGGGCGGGC TGGGGGTGTG
CGAGGCGCGG CCGCGCGGG AGCGTGATT GGTGCGGGG TGGCGGGTG GCGGGGGCG CCGGGGTGG CTGCGGGAG
60 CGAGCTCCCG ACCCCGCGC CCCCAGCGCC CCGCGCGCCA GCTCTCCGC TCCCGCGCC CCGCGCGCC CCGCGCGCC
ATGGCTCTG CCCCCTCCG CAGGTGCGC TCGCGCCCG GCTCTGCGC CCCACCGGC GGGCTCTGG GAGGGCTGT
AAGGGTCTC CCGTGGGAGA GGTCCGTGT TCCCGGACT CTGCTGGGC TTTTGGTCC TCCCCTGT CCGAGCCAG
TCGGGCTCCC GCGGCGCGG GAGGGGCGG GTTCTGCTCT GTGCTTCCC CACCATCCG CCCCAGGGG CAGATTCCG
GCTCCGCGG GCGGACGGGA GACGCGCGG CCGCTCTGCT TCCGACGGG GGGGACGCA GAGCCAGGGA GGGAGAGGGA
65 AGCCGCGCTG GCGCTGCGAC CTGCCCCGCG GCGTCCACC CTGGGACTTA AGACCTCCAG CTCCATCTCT CTAAGGCGC
GGAGTCCAG CCCCAGACCC TCCTCCCGA GACCCAGGAG TCCAGACCCC AGGCCTTCT CACTCAGAC TAGGAGTCA
GGCCCCAGC CTCTCTCC TACAGCCAG GAGGAGTCCA GACCCAGTT CTTCTCCCT CAGACCCGG AGTCCAGCC
AGGCCCTCT CTCTCAGACC CGGAGTCCAG CCGTGTGCT CTGCTTATC CTGCCCCAG GTGTTTGGCG CCGTGTCTG
GTCGTGTGA GCTGTGGCC AGATACAGCT GTGCCCCCT GGGCACCACC TGGCCCCCT CGAGTTTCCC CAGACCTCG
70 GGCCGAGCTG GACAGCACCG TGCTCTGAC CCGCTCTCT CTGGCGGACA CGCGGACGT GGTCTCAGC GTGAGGAG
AGACTGGCT GGGGCCAGCA CAGGAGTGA AGGCAGAGAG GAACGGAGAG GAGTCTGCG GCAGCCACTT GGAGGGGTTT
TGGGCTCTCA GGTGGCAGAG TGAGGAGGG GAAGAGTTG GGGCCTGGCG TGGGGGATGG AGGGAGCCCC GAGGCTGGC
AGGGGCCAC TCACAGCTTT TTTCCCTGCC AGAGGAGCAA ATCCAGACT GACGGGAGC ACAACCTGGA TCCCTGCC
ACCCTGGCCA TGAGTGACAG GGCAGTGGGA GCTCTACAG TAAAGGCAAG GAGTGGGT GGGGACCAAG TGGGCGAGC
75 GCAGTGAAG GGGCGGGGAG GATGAGGGG ACTGGTGGG TGTCTCTGA TGTCGGCT CTATCCCCAG CTCCAGGTG

	TGCTGACAAG	GCTGCGAGCG	GACCTACTGT	CCTACCTGCG	GCACGTGCAG	TGGCTGCGCC	GGGCAGGTGG	CTCTTCCCTG
	AAGACCTTGG	AGCCCGAGCT	GGGCACCTCG	CAGGCCCGAC	TGGACCGGCT	GCTGCGCCGG	CTGCAGCTCC	TGGTATGTCC
	TGGCCCAAG	ACCTGACACC	CCAGACCCCC	ACCCCTGGCC	CCAAAATCCT	GTGGCCTGAG	CTCTTGAAGC	CTGAGACCCC
	AGACCCGAGT	GCAACAGCCC	CGCTCTGAGA	CCCTGACACC	CTAACAGCCC	GCTCTGAGAC	CCTGACACCG	TAACAGCCCC
5	GCTCTGAGAC	CCTGACCCTA	ACAGTCTGCG	TCTGAGACCC	TGACCTGCA	GTCCCAAGAT	CCTGTGGCCC	TGAGACCCCTG
	AGGCCTAGA	CCCCCAATC	CTGCCAGAA	ACTTCAATTC	CTACCCCAAG	ACCCTGAGAC	TCCATCATCC	ATGACCTCAA
	AGTCCCCAGA	TCCCAGCCCC	TAAGACCCAA	GACCCCATCC	TGAAGCCCAA	AGCCTTGAGA	ATTCAAATCC	TCACCTCAAG
	ACTTGGAGAC	CCTGGCCCCA	TGACATTGAA	AACCATGGAC	CTGGCCAGGC	GTGGTGGCTC	ACGCCTGTAA	TCCCAGCACT
	TTGGGAGGCC	GAGGCAAGTG	GATCACCTGA	GGTCCGGAGT	TCAAGACCAG	CCAGACCAAC	ATGGTGAAAC	CCTGTCTCTA
10	CTAAAAATAC	AAAATTAGCC	AGGCGTGGTG	GTGCATGCCT	GTAATCCCCAG	CTACTTGGGA	GGCTGAGGCA	GGAGAATCGC
	TTGAACCTGG	GAGGCGGAGG	TTGCAGTGAG	CCGAGATCGC	ACCATTACAC	TCCAGCCTGG	GCAACAAGAG	CAAACTCCCC
	TCTCTCTCAA	AAAAAAAAAA	AAAAAAAAAA	AAGAAGGAAA	AGAAAACCAT	GGACCTCCAG	ACCCTGAGAC	CCCAGGCCCC
	AGCCCTGAGA	TCTTGACATC	TTAAAGATCC	CAGGCCCTAA	GATACAAGAC	CTTGACCCAA	AGCCAGCCTT	GGGACCTGGG
	CTGTACAAAC	CCAAGACCTC	CAGGACCTAG	ACCCCGAGCC	CTAGAGCCCT	ATGTCTCACT	AGCCAGCTCG	AAAACCTGGA
15	CACCTCAGAT	CCTGAGCCTG	CGCCTGTACG	ACTCCAAGAC	CCTCACTTCC	AAAGCCAGGC	CCAAAGCCCT	GAGACCAGAA
	GACTTCAAAC	CCTGGTTCTT	GGGCCTAACT	CCAAAGACCC	TGGATCTCAA	ATTCCAACCT	CTAGCTCTGA	GACTCCAGCC
	CTCACCCATG	AGTTCCTGAA	CTTGAACCCA	GAGACCCCAT	ATCCCAAGACT	TCAGCCTTGA	GCTCCAGGGC	CTGACCTTAG
	ACTCGAGCCC	ACAGACCTCA	GATACTGTCT	GTAACACCCC	AGCTCTGGTG	GGGAGCAGTG	GCTCACTCCT	GTAATCCCAA
	GGCAGGGGAG	GCCAAGGCAG	AAGGACCTCT	TGAGGCCATG	AGTTTGAGAC	AGCCTGGGCA	GCATAGCAAG	ACTCTGTITC
20	TTAATTATTA	TTATTATTAT	TATTTTGTG	AGACAGAGTC	TCGCGCTCTG	TTGCCAGGC	TAGAGTGCAA	TGGTGCCATT
	TCGGCTTGCT	GGAACTCCCG	CCTCCTGGGC	TCAAGCGATT	CTCCTGCCCT	TAGCTCTGTA	AGCCTCGGGA	CTGAGCTGTC
	ACACTGCCAC	ACCCGATATA	TTTTTTGTGA	TTTAGTAGA	CACAGGGTTT	CACCGTGTG	CCCAGGCTGG	TCACAACTC
	CTGAGCTCAG	GCCATCCGCC	CGCCTCGGCC	TCCCAAGGAG	CTGGGATAAC	AGGCGTGACG	CCCGCGCTCG	CTTCTTAATT
	GTTCCTAACAG	CAGCGACAAC	AACAAAAACC	CAGCTCTGAG	ATTCAGACCC	CGGCGACTCT	AACAGTCCCA	GGCCCCGATCC
25	CTCACCTAGA	ACCGAGATGC	CAGCCCTGAC	TCCACAGACT	TCACCCCAAC	CCCCCAGACT	CAGCTCTGGA	AGCCCCGTCT
	GACTCCAGCC	TCCATTTTCG	GAACCCACAC	GCCTGAAGAG	CTCCCGGCTT	AAACACTTCA	CCCCACGCGC	CACAGTCCCC
	CTGTGAATAT	GCAGCCCCGA	TTAGCTGCA	GCTCCACAGC	ACCCCTGGCC	TGCACCCCCG	CTGCACCCCC	TACCTGTGAC
	TCACCTCTCT	CTCTCCCCA	CAGATGTCCC	GCCTGGCCCT	GCCCCAGCCA	CCCCCGGACC	CGCCCGGCGC	CTCGCTGGCG
	CCCCCTCTCT	CAGCCTGGGG	GGGCATCAGG	CGCGCCACG	CCATCTGGG	GGGGCTGCAC	CTGACACTTG	ACTGGGCCGT
30	GAGGGGACTG	CTGTGCTGTA	AGACTCGGCT	GTGACCCGGG	GCCCAAAGCC	ACCACCGTCC	TTCCAAAGCC	AGATCTTATT
	TATTTATTTA	TTTCAGTACT	GGGGGCGAAA	CAGCCAGGTG	ATCCCCCGCG	CATTATCTCC	CCCTAGTTAG	AGACAGTCTC
	TCCGTGAGGC	CTGGGGGGCA	TCTGTGCCTT	ATTTATACTT	ATTTATTTCA	GGAGCAGGGG	TGGGAGGCAG	GTGGACTCCT
	GGGTCCCCGA	GGAGGAGGGG	ACTGGGGTCC	CGGATTCTTG	GGTCTCCAAG	AAGTCTGTCC	ACAGACTTCT	GGCCTGGCTC
	TTCCCCATCT	AGGCCTGGGC	AGGAACATAT	ATTATTTATT	TAAGCAATTA	CTTTTCATGT	TGGGGTGGGG	ACGGAGGGGA
35	AAGGGAAAGC	TGGGTTTTTG	TACAAAAATG	TGAGAAACCT	TTGTGAGACA	GAGAAACAGG	AATTAATGT	GTTCATACATA
	TCCACTTGAG	GGCGATTTGT	CTGAGAGCTG	GGGCTGGATG	CTGGGGTAAC	TGGGGCAGGG	CAGGTGGAGG	GGAGACCTCC
	ATTCAGGTGG	AGGTCCCGAG	TGGGCGGGGC	AGCGACTGGG	AGATGGGTGG	GTCACCCAGA	CAGCTCTGTG	GAGGCAGGGT
	CTGAGCCTTG	CCTGGGGCCC	CGCACTGCAT	AGGCGCGTTT	GTTTGTTTTT	TGAGATGGAG	TCTCGCTCTG	TGCTCATAGG
	TGGAGTGCAG	TGAGGCAATC	TAAGGTCACT	GCAACCTCCA	CCTCCCGGGT	TCAAGCAATT	CTCCTGCCTC	AGCCTCCCGA
40	TTAGCTGGGA	TCACAGGTGT	GCACCACCAT	GCCAGCTAA	TTATTTATTT	CTTTGTATT	TTTAGTAGAG	ACAGGGTTTC
	ACCATGTTGG	CCAGGCTGGT	TTGAACTCC	TGACCTCAGG	TGATCTCCTT	GCCTGGCCCT	CCCAAGTGC	TGGGATTACA
	GGTGTGAGCC	ACCAACCTG	ACCCATAGGT	CTTCAATAAA	TATTTAATGG	AAGGTTCAC	AAGTCCCTCT	GTGATCAACA
	GTACCCGTAT	GGGACAAAGC	TGCAAGGTCA	AGATGGTTCA	TTATGGCTGT	GTTCAACATA	GCAAACTGGA	AACAATCTAG
	ATATCCAACA	GTGAGGGTTA	AGCAACATGG	TGCATCTGTG	GATAGAACGC	CACCCAGCCG	CCCGGAGCAG	GGACTGTICAT
45	TCAGGGAGGC	TAAGGAGAGA	GGCTTGCTTG	GGATATAGAA	AGATATCTCT	ACATTGGCCA	GGCATGGTGG	CTCACGCCCTG
	TAATCCTGGC	ACTTTGGGAG	GACGAAGCGA	GTGGATCACT	GAAGTCCAAG	AGTTTGAGAC	CGGCCCTGCG	GACATGGCAA
	AACCTGTCT	CAAAAAAGAA	AGAATGATGT	CCTGACATGA	AACAGCAGGC	TACAAAACCA	CTGCATGCTG	TGATCCCAAT
	TTTGTGTTTT	TCTTTCTATA	TATGGATTAA	AACAAAAATC	CTAAAGGGAA	ATACGCCAAA	ATGTTGACAA	TGACTGTCTC
	CAGGTCAAGG	GAGAGAGGTG	GGATTGTGGG	TGACTTTTAA	TGTGTATGAT	TGTCTGTATT	TACAGAAATT	TCTGCCATGA
50	CTGTGTATTT	TGATGACAC	ATTTTAAAAA	TAATAAACAC	TATTTTAGA	ATAACAGAAT	ATCAGCCTCC	TCCTCTCCAA
	AAATAAGCCC	CAGGAGGGG	ACAAAGTTGA	CCGCTGATTG	AGCCTGTGAC	GGCTGTGCAC-3'	(FRAG. NO:)	(SEQ ID NO:11892)
	5'-GCTCAGGGCA	CTAGCTCTCC	CTCCCCAGGC	CGCGGCTTCC	CTGACCCCTG	GGGCTCCCCC	GGCAGGGAGC	AGGGAAGGGT
	TAAAGGCCCC	CGGCTCCCTG	CCCCCTGCC	TGGGGAACCC	CTGGCCCTGT	GGGACATGA	ACTGTGTTTG	CCGCTGGTCC
	CTGGTCTGTC	TGAGCCTGTG	GCCAGATACA	GCTGTGCCCC	CTGGGCCACC	ACCTGGCCCC	CCTCGAGTTT	CCCCAGACCC
55	TCGGGCGGAG	CTGGACAGCA	CCGTGCTCCT	GACCCGCTCT	CTCCTGGCGG	ACACGCGGCA	CTGGCTGCA	CAGCTGAGGG
	ACAAATTCCC	AGCTGACGGG	GACCAACAAC	TGGATTCTCT	GCCCCACCTG	GCCATGAGTG	GGGGGGCAGT	GGGAGCTCTA
	CAGCTCCAG	GTGTGCTGAC	AAGGCTGCGA	GCGGACCTAC	TGTCTACCT	GCGGCACGTG	CAGTGCTGTC	GCCGGGCGAG
	TGGCTCTTCC	CTGAAGACCC	TGGAGCCCGA	GCTGGGCACC	CTGCAGGCC	GACTGGACCG	GCTGCTGCGC	CGGCTGCAGC
	TCCTGATGTC	CCGCTGGGCC	CTGCCCCAGC	CACCCCGGGA	CCCGCGGGCG	CCCCCGCTGG	CGCCCCCTC	CTCAGCTTGG
60	GGGGGCATCA	GGGCCGCCCA	CGCCATCCTG	GGGGGGCTGC	ACCTGACACT	TGACTGGGCC	GTGAGGGGAC	TGCTGTGCT
	GAAGACTCGG	CTGTGACCCG	GGGCCCAAG	CCACCACCGT	CCTTCCAAAG	CCAGATCTTA	TTTATTTATT	TATTTAGTA
	CTGGGGGCGA	AACAGCCAGG	TGATCCCCC	GCCATTATCT	CCCCCTAGTT	AGAGACAGTC	CTTCCGTGAG	GCCTGGGGGA
	CATCTGTGCC	TTATTTATAC	TTATTTATTT	CAGGAGCAGG	GGTGGGAGGC	AGGTGGAGTC	CTGGGTCCCC	GAGGAGGAGG
	GGACTGGGGT	CCCGGATTCT	TGGGTCTCCA	AGAAGTCTGT	CCACAGACTT	CTGCCCTGGC	TCTTCCCAT	CTAGGCCTGG
65	GCAGGAACAT	ATATTATTTA	TTTAAGCAAT	TACTTTTCAT	GTTGGGGTGG	GGACGGAGGG	GAAAGGGGAG	CCTGGGTTTT
	TGTACAAAAA	TGTGAGAAAC	CTTTGTGAGA	CAGAGAACAG	GGAATTAAT	GTGTCATACA	TATCC-3'	(FRAG. NO:)
	5'-CAGTGTGCGG	ATCTCTGTG	TCAGAGTCTT	GGTGTCTCTG	TTCTTTTCCC	CTCGGGGTCT	CCCTGGGTCT	CCCCAAGTCC
	CTCTGCTGT	CTTCTCTCCG	CTCTCTGATC	TCTGATCTCC	AGAAGCTCTC	CCTCTGTCTC	CAGGCGTCC	CCTCTGATCC
70	TCTTTGCTTC	TCTGGTGTGT	CTCTCTGGCT	GCCTTCACT	CTGTGGATCT	CCGTCTCCCT	GTCTCTGTCT	CAGTCTGTCC
	TTCACTCTGT	GTGTGTGTGT	GTCTCTCTCT	CTCTCTCTCC	TTCCCTTCCA	CTCCCTCTTC	CTCCTGCTC	CACCTCTCCA
	GGCCCTGTG	TTGTCCCTCC	GTCCGGCCTT	TCTCTGCTT	TCCGTCTCC	TGCTTCCCCA	TCTCTCTCTG	CTAGTCTGCT
	CCAGCCGAGT	CCCCACCCAC	AGTCGGGCGC	CAGGCTGTGA	GCCTGAGTGT	CTGCTCCGGC	CCGTGGAGGT	GGAGGGAGGG
	GACGCCAATG	ACCTCACCAG	CCCTCTCCG	ACCACCCCCC	CCTTCCCTTT	TTCAACTTTT	CCAACCTTTT	CTTCCGTGCC
75	CTCCTCCGAG	CGCGCGGGCG	TGAGCCCTGC	AAGGCAGCCG	CTCCGTCTGA	ATGGAAAAGG	CAGGCAGGGA	GGGTGAGTCA

GGATGTGTCA GGCCGGCCCT CCCCTGCCGC CTGCCCCCGG CCCGCCCGCC CCAGGCCCCC TATATAACCC CCCAGGCGTC
 CACACTCCCT CACTGCCGCG GGCCTGTCTG CTCAGGGCAC ATGCCTCCCC TCCCAGCCCG CGGGCCAGC TGACCTCTCG
 GGCTCCCCCG CGAGCGGACA GGGGAAGGTT AAAGGCCCCC GGCTCCCTGC CCCCTGCCCT GGGGAACCC TGCCCTGTG
 GGGACATGAA CTGTAAGTTG GTTCATGGGG AGGGTGGAGG GGACAGGGAG GCAGGGAGGA GAGGGACCCA CGGCGGGGGT
 5 GGGAGCAGAC CCCGCTGAGT CGCACAGAGA GGGACCCGGA GACAGGCAGC CGGGGAGGAG AGCAGCTTCG GAGACAGGAG
 GCGGCGGAGG AGATGGGCAG AGAGAGACAC AGACAGGAGC GGATGGAGGC AGCCAATCAG AGGCGCCGCA GGAGGGACGG
 GCCAGACAGG GCCCGAGAGG AGCGAGACGC GAGACCGAGC AGGGGAGGG ACGCAGGGAC TGGTGCCGGG AGGGAGGTGA
 CCCCCATCGA CCCAGGCCCC AGGGAGCCCG CGGGGACCGG GAGACTCCCT GGGATTCCGG CAGAGAGGCT CCGGAGGGAA
 ACTGAGGCAG GGTCGCCGGA GAGCGAGACA AGCCAGGGAG TAGCGACCCC AGCCGGGGGG AGGAGAGAGA CTGGGCGCCG
 10 GGGGAAGCG GGGAGAGCCG GGCAGATGCG GCGACGGAG GCGCGGACAG ACCGACGGCT GCGGGCGGG GGGGGCGGGC
 TGGGGGTGTG CGAGGCGCGG GCGGCCGGGG AGCGCTGATT GGCTGGCGGG TGGCGGGTG GCGGGGGCG CCGGGGTGGG
 CTGGCGGGAG CGAGCTCCGG ACCCCCGCGC CCCCGCGGCC CCCGCGCCCA GCTCTCCGCT TCCCGCGGCC
 CGGCGGGGCC ATGGCTCTGC CCCTCTCCGC CCAGTGTGCG TGCGGCCCGG GCTTCTGCGG CCCACCCGGC GGGCTCTGCG
 GAGGCGCTCT AAGGGGTCTC CCGTGGGAGA GTTCCGTGTC TCCCGGACTC CGTCTGGGC TTTTGGCTCC TTGGCTGCT
 15 CCCAGCCAGC TCGGGCTCCC GCGGCCCGGG GAGGGGGCAG GTTCTGGCCT GTGCTTCCC CACCATCCGC GCCCGGGGGC
 CCAGATTCCG GCGTCCGGGG GCGGACGGGA GACGCGCGGG CCGCTCTGCG TCCGACGGGC GGGGCGAGCA GAGCCAGGGA
 GGGAGAGGGA AGCCCCCTCG GCCCTGCGAC CTGCCCCGGG GCGTTCACCC CTGGGACTTA AGACCTCCCA CTCATCTCT
 CCTAAGGCGG GAGATCCAGG CCCAGAGACC CTCTCCCGA TCCAGAGGAG TCCAGAGCCC AGGCTTCTCT CCTCAGACC
 TAGGAGTCCA GGCCCCCAGC CTCTCTCCC TCAGACCCAG GAGGAGTCCA GACCCCAATT CCTCTCCCT CAGACCCGGG
 20 AGTCCAGCCC AGGCCCTCCT CTCTCAGACC CGGAGTCCAG CCTGAGCTCT CTGCTTATC CTGCCCCAG GTGTTTGCGG
 CCTGGTCCG GTCTGTGCTG GCCTGTGCTG AGATACGACT GTCCGCCCTG GCGCACCACT CGAGTCTGCT TCCCTTCCC
 CAGACCTCG GCGCGAGCTG GACAGCACCG TGCTCTGAC CCGCTCTCTC CTGGCGGACA CGCGGACGT GGCTGCACAG
 CTGTTAGGAG AGACTGGGCT GGGGCCAGCA CAGGAGTGAG AGGCAGAGAG GAACGGAGAG GAGTCTGCGG GCAGCCACTT
 GGAGGGGTTT TGGGCTCTCA GGTGGCAGAG TGAGGGAGG GAAGAGTTGG GGGCTTGGG TGGGGGATGG AGGGAGCCCC
 25 GAGGCTGGGG AGGGGCCACC TCACAGCTTT TTTCCCTGCC AGAGGGACAA ATTCCAGCT GACGGGGACC ACAACCTGGA
 TTCCCTGCCC ACCTGGCCA TGAGTGCAGG GGCAGTGGGA GTCTACAGG TAAGGGCAAG GGAGTGGGCT GGGGACAAGG
 TGGGAGGCG GCAGTGAAGG GGGCGGGGAG GATGAGGGGC ACTGGTCCGG TGTTCTCTGA TGTCCCGCT CTATCCCCAG
 CTCCCAGGTG TGCTGACAAG GCTGCGAGCG GACCTACTGT CACTACCTGC GCACGTGACG TGGCTGCGCC GGGCAGGTGG
 CTCTTCCCTG AAGACCCTGG AGCCCGAGCT GGGCACCTG CAGGCCCCGAC TGGACCGGCT GCTGCGCCGG CTGCAGCTCC
 30 TGGTATGTCC TGGCCCCAAG ACCTGACACC CCAGACCCCC ACCCTGGGCC CCAAAATCCT GTGGCCTGAG TCCTTGAAGC
 CTGAGACCCC AGACCCGAGT GCAACAGCCC CGCTCTGAGA CCTGACACC CTAACAGCCC GCTCTGAGAC CCGTACCCG
 TAACAGCCCC GCTCTGAGAC CCGTACCCTA ACAGTCTGCG TCTGAGACCC TGACCCCTGA GTCCCAAGAT CTGTGCCCC
 TGAGACCCCT AGGCCCTAGA CCCCCAAATC CTGCCAGAA ACTTCAAATT CTCACCAAG ACCCTGAGAC TCCATCATCC
 ATGACCTCAA AGTCCCCAGA TCCCAGCCCC TAAGACCCAA GACCCCATCC TGAAGCCCAA AGCCTTGAGA ATTCAAATCC
 35 TCACCTCAA ACTTGGAGAC CCGTGGCCCC TGACATTGAA AACCATGGAC CTGGCCAGGC GTGGTGCTC ACGCTTGTA
 TCCCAGCACT TTGGGAGGCC GAGGCAAGTG GATCACCTGA GGTCCGGAGT TCAAGACCAG CCAGACCAAC ATGGTGAAAC
 CCTGTCTCTA CTAATAATAC AAAATTAGCC AGGCGTGGTG GTGCATGCGT GTAATCCAG CTAATTGGGA GGCTGAGGCA
 GGAGAATCGG TTGAACCTGG GAGGCGGAGG TTGCAGTGAG CCGAGATCGC ACCATTACAC TCCAGCTGG GCAACAAGAG
 CAAAACCTCC TCTCTCAA AAAAAAATAA AAAAAAATAA AAGAAGGAAA AGAAAAACCAT GGACCTCCAG ACCCTGAGAC
 40 CCCAGGCCCC AGCCCTGAGA TCCTGACATC TTAAGATCC CAGGCCCTAA GATACAAGAC CTGACCCAA AGCCAGCCTT
 GGGACCCCTG CTGTACAAAC CCAAGACCTC CAGGACCTAG ACCCCGAGCC CTGAGGCCCT ATGTCTCACT CCAACATCG
 AAAACCCCTG ACTGTAGAT CCGTACGCTG CGCCTGTACG ACTCACTTCC CCAAGCCAGG CCAAGGCCCT CCAAGGCCCT
 GAGACCAGAA GACTTCAAAC CCTGGTCTCT GGGCCTAACT CCAAGACCC TGGATCTCAA ATTCCAATT CTAGCTCTGA
 45 CTGACCCATG CTACCCATG AGTTCCTGAA CTGTAACCCA GAGACCCCAT CTCTAAGACT TCAGCCTTGA GATCCAGGCG
 CTGACCTAG ACTGAGGCC ACAGACCTCA GATACCTCT GTAAAACCCC AGCTCTGGTG GGGAGCAGTG TCCAGCTCT
 GTAATCCCAA GGCAGGGGAG GCCAAGGCAG AAGGACCTCT TGAGGCCATG AGTTTGAGAC AGCCTGGGCA GCATAGCAAG
 ACTCTGTTTC TTAATTATTA TTATTATTAT TATTTTGG AGACAGATC TCGCGCTCTG TTGCCAGGC TAGAGTGCAA
 TGGTGCCATT TCGGCTTGCT GGAACCTCCG CCTCTGGGG TCAAGCGATT CTCTGCTC AGGCTCTGA GTAGCTGGGA
 50 CTTCAAGTGC CCACTTGAG ACCCGATAA TTTTTTGA TTTTAGTGA CACAGGGTTT CACCGTGTG CACAGCTGG
 TCACAAACTC CTGAGCTCAG GCCATCCGCC CGCTCGGCC TCCAAAGCG CTGGGATAAC AGGCGTGACG CCGCGCTGG
 CTCTTAAAT GTTCTAACAG CAGCGACAAC AAAAAAACC CAGCTCTGAG ATTCCAGCCC CGGCGACTCT AACAGTCCA
 GGCCGAGTCC CTCACCTAGA ACCGAGATGC CAGCCTGAG TCCACAGACT TCACCCCAA CCCCCACT CAGCTCTGGA
 AGCCGCTCCT GACTCCAGCC TCCATTTTCG GAACCCACA GCCTGAAGAG CTCCCGGCT AAACACTTCA CCCCACGCGC
 CACAGTCCCC CTGTGAATAT GCAGCCCCGA TTCAGCTGCA GCTCCACAGC ACCCCTGCC TGCACCCCG CTGCACCCCC
 55 TACCTGTGAC TCACCTCTCT CCTCTCCCA CAGATGTCCC GCTTGGCCCT GCGCCAGCCA CCGCCGGACC CGCGCGCGC
 CCCGCTGGCG CCCCCTCCT CAGCTGGGG GGGCATCAGG GCGGCCACG CCATCCTGGG CCGGCTGCAC CTGACACTTG
 ACTGGGCCGT GAGGGGACTG CTGCTGCTGA AGACTCGGCT GTGACCCGGG GCGCAAAGCC ACCACCGTCC TTCCAAAGCC
 AGATCTTATT TATTTATTTA TTTCAGTACT GGGGGCGAAA CAGCCAGGTG ATCCCCCGC CATTATCTCC CCTAGTTAG
 60 AGACAGTCTT TCCGTGAGGC CTGGGGGCA TCTGTGCTT ATTTAATCT ATTTATTCA GGAGCAGGG TGGGAGGCG
 GTGGACTCCT GGGTCCCCGA GGAGGAGGGG ACTGGGGTCC CGGATTCTTG GGTCTCCAAG AAGTCTGTCC ACAGACTTCT
 GCCCTGGCTC TTCCCATCT AGGCTGGGC AGGAACATAT ATTATTATT TAAGCAATTA CTTTTCATGT TGGGGTGGGG
 ACGGAGGGGA AAGGGAAGCC TGGGTTTTG TACAAAAATG TGAGAAACCT TTGTGAGACA GAGAACAGGA AATTAATGT
 65 GTCATACATA TCCACTTGAG GCGGATTGT CTGAGAGCTG GGGCTGGAT CTTGGGTAA TGGGCGAGG CAGGTGGAGG
 GGAGACCTCC ATTCAAGTGG AGGTCCCGAG TGGGCGGGG AGCGACTGGG AGATGGGTG GTCACCCAGA CAGCTCTGTG
 GAGGAGGGGT CTGAGCCTTG CCTGGGGCCC CCGACTGCAT AGGGCCGTTT GTTTGTTTT TGAGATGGAG TCTCGCTCTG
 TTGCTAGGCT TGGAGTGCAG TGAGGCAATC TAAGGTCACT GCAACCTCA CCTCCGGGT TCAAGCAAT CTTTGTATT TTTAGTAGAG
 AGCTCCCGA TTAGCTGGGA TCACAGGTGT GCACACCAT GCGCAGCTAA TTTTATTATT TTTTGTATT TTTAGTAGAG
 ACAGGGTTTC ACCATGTTTG CCAGGCTGGT TCCGAATCC TGACCTCAGG TGATCTCCT GCCTCGGCT CCAAAAGTGC
 TGGGATTACA GGTGTGAGCC ACCACACCTG ACCATAAGT CTCAATAAA TATTTAATGG AAGTCTCCAC AAGTCACTCT
 70 GTGATCAACA GTACCCGTAT GGGACAAAGC TCCAGGTCA GTTGAGTTCA TTATGGCTGT TTATGACTTA GTTACCTGA
 AACAACTAG ATATCCAACA GTGAGGGTTA AGCAACATGG TGCATCTGTG GATAGAACGC CACCCAGCCG CCGGAGCAG
 GGAAGTGTCT TCAAGGAGGC TAAGGAGAGA GGTCTGCTTG GGATATAGAA AGATATCCTG ACATTTGGCA GGCATGGTGG
 CTCACGCGCT TAATCTGGC ACTTTGGGAG GACGAAGCGA GTGAGTCACT GAGTTCAGG AGTTTGAGAG AGTTTGAGAG CCGCTGCGA
 75 GACATGGCAA AACCTGTCT CAAAAAGAA AGAATGATGT CCTGACATGA AACAGCAGGC TACAAAAACA CTGCATGCTG
 TGATCCCAAT TTTGTGTTTT TCTTCTATA TATGGATTAA AACAAAAATC CTAAAGGGAA ATACGCCAAA ATGTTGACAA

TGACTGTCTC CAGGTCAAAG GAGAGAGGTG GGATTGTGGG TGACTTTTAA TGTGTATGAT TGTCTGTATT TTACAGAATT
TCTGCCATGA CTGTGTATTT TGCATGACAC ATTTTAAAAA TAATAAACAC TATTTTATAGA ATAACAGAAT ATCAGCCTCC
TCCTCTCCAA AAATAAGCCC TCAGGAGGGG ACAAAGTTGA CCGCTGATTG AGCCTGTGAC GGCTGTGCAC-3' (FRAG. NO:) (SEQ
ID NO:11891)

5 **Human GM-CSF Nucleic Acid and Antisense Oligonucleotide Fragments**

5'-CTTGBGCBGG BBGCTCTGGG GCBGGGBGCT GGCBBGGGCC BGGGGGGTGG CTTCCTGCBC TGTCBGBGT GCBCTGTGCC
BCBGCBCBGG CTGCBGGGCC BTCBGCTTCB TGGGGCTCTG GGTGGCBGGT CCBGCCBTGG GTCTGGGTGG GGCTGGGCTG
CBGGCTCCGG GCGGTCCBGGCBTGGGTCTG GGGGCTGGG CTGCBGGCTC CGGGCGGGCG GGTGCGGGCT GCGTGTGGG
GGCTGCCCG CAGGCCCTGC GGTCCBGGCB TGGGTCTGGG GGCTGGGCTG CBGGCTCCGG GCGGGCGGGT GCGGGCTGCG

10 TGCTGGGGGC TGCCCGCAG GCCCTGC-3' (FRAG. NO:1847) (SEQ ID NO:11229)

5'-GBGCBGG BBG-3' (FRAG. NO:1848) (SEQ ID NO:11230)

5'-GCCBCBGCBCBGC-3' (FRAG. NO:1849) (SEQ ID NO:11231)

5'-GGG TGC GGG C-3' (FRAG. NO:1850) (SEQ ID NO:11232)

5'-GGT CCB GCC BTG GGT CTG GG-3' (FRAG. NO:1300) (SEQ ID NO:10678)

15 5'-GGC TGG GCT GCB GGC TCC GG-3' (FRAG. NO:1301) (SEQ ID NO:10679)

5'-GCG GGC GGG TGC GGG CTG CGT GCT GGG-3' (FRAG. NO:1302) (SEQ ID NO:10680)

5'-GGC TGC CCC GCA GGC CCT GC-3' (FRAG. NO:1303) (SEQ ID NO:10681)

20 5'-CTTGBGCBGG BBGCTCTGGG GCBGGGBGCT GGCBBGGGCC BGGGGGGTGG CTTCCTGCBC TGTCBGBGT GCBCTGTGCC
BCBGCBCBGG CTGCBGGGCC BTCBGCTTCB TGGGGCTCTG GGTGGCBGGT CCBGCCBTGG GTCTGGGTGG GGCTGGGCTG
CBGGCTCCGG GC-3' (FRAG. NO:1851) (SEQ ID NO:11233)

Human Tumor Necrosis Factor (Antisense Oligonucleotide Fragments)

25 5'-GCBCCGCTG GBGCCCTGGG GCCCCCTGT CTCTTGGGG BGCCCTCTCT CGGCCBGGCTC CBCGTCCCGG BTCBTGCTTT
CBGTGCTCBT GGTGTCTTT CCBGGGGBGB GBGGGGCTGG TCCTCTGCTG TCCTTGCTGG TGCTCBTGGT GTCCTTTCCG
CCCTGGGGCC CCCCTGTCTT CTGGGGCCT CTCCCTCTG GGGGCCGTCT CTCTCCCTCT CTTCGCTCT GTCCTTCTC
TCTCTCTCT CCCCTTCCC GCTCTTCTG TCTCGGTGTC TGGTTTCTC TCTCCGCTGG CTGCGTCTT GGCCTGCGCT
CTTGGCCTGT GCTGTCTCT CTCGGTTCC TGTCTCTCT GTCTGTCGCC CCCTCTGGGG TCTCCCTCTG GGTGGTGGTC
TTGTGCTTG GGTGGGCTC CGTGTCTCB GTGCTCBTGG TGTCCGTGB GGBGCGCTCT GCTGGCGCTG GTCCTCTGCTGTC
CTTGCTGGTG CTCTGGGTGT CCTTTCGCC CTGGGGCCCC CCTGTCTCT TGGGGCTCT TCCCTCTGGG GGCGGCTC
TCTCCCTCT TGGGCTCT CTCTTCTCT CTCTCTCT CTCTTCCC CTCTTCTGT CTGCGTGT GTTCTCTCT

30 5'-GCGGCTGGG TGCCTGTCTG GCCTGCGCTC TTGGCCTGTG CTGTTCTCC TCCGGTCTCT GTCCTCTCTG TCTGTGCCCC
CCTCTGGGT CTCCCTCTGG CGTGTGGTC TTGTGCTTG GGCTGGGCTC CGTGTCTCB GTGCTCBTGG TGTCCGCTGB
GGGBGCGTCT GCTGGC-3' (FRAG. NO:1852) (SEQ ID NO:11234)

5'-GGGGCCCCC-3' (FRAG. NO:1853) (SEQ ID NO:11235)

5'-GGG GGC CG TCT-3' (FRAG. NO:1854) (SEQ ID NO:11236)

35 5'-CCBGGGGBGB GBGGGGCTGG-3' (FRAG. NO:1855) (SEQ ID NO:11237)

5'-GCBCCGCTG GBGCCCTGGG GCCCCCTGT CTCTTGGGG BGCCCTCTCT CGGCCBGGCTC CBCGTCCCGG BTCBTGCTTT
CBGTGCTCBT GGTGTCTTT CCBGGGGBGB GBGGG-3' (FRAG. NO:1304) (SEQ ID NO:10682)

40 5'-GCT GGT CCT CTG CTG TCC TTG CTG GTG CTC BTG GTG TCC TTT CC GCC CTG GGG CCC CCC TGT CTT CTT GGG G CCT
CTT CCC TCT GGG GGC CG TCT CTC TCC CTC TCT TGC GTG TCT C TCT TTC TCT CTC TCT CTT CCC C TTT CCC GCT CTT TCT
GTC TC GGT GTC TGG TTT TCT CTC TCC GCT GGC CTG TGT GTC CTC CGC TCT T GGC CTG TGC TGT TCC TCC TCC GGT
TCC TGT CCT CTC TGT CTG TC GCC CCC TCT GGG GTC TCC CTC TGG C GTG GTG GTC TTG TTG CTT GGG CTG GGC TCC GTG
TCT C CBG TGC TCB TGG TGT CC-3' (FRAG. NO:1305) (SEQ ID NO:10683)

45 5'-GCT GBG GGB GCG TCT GCT GGC GCT GGT CCT CTG CTG TCC TTG CTG CTC BTG GTG TCC TTT CC GCC CTG GGG CCC
CCC TGT CTT CTT GGG G CCT CTT CCC TCT GGG GGC CG TCT CTC TCC CTC TCT TGC GTC TCT C TCT TTC TCT CTC TCT CTT
CCC C TTT CCC GCT CTT TCT GTC TC GGT GTC TGG TTT TCT CTC TCC GCT GGC TGC CTG TCT GGC CTG CGC TCT T GGC CTG
TGC TGT TCC TCC TCC GGT TCC TGT CCT CTC TCC TCC TCC TCC TCC TCC TCC TCC TCC TCC TCC TCC TCC TCC TCC TCC
CTT GGG CTG GGC TGT GTG TCT C CBG TGC TCB TGG TGT CC GCT GBG GGB GCG TCT GCT GGC-3' (FRAG. NO:1306) (SEQ ID
NO:10684)

5'-GCT GGT CCT CTG CTG TCC TTG CTG-3' (FRAG. NO:1655) (SEQ ID NO:11033)

50 5'-GTG CTC BTG GTG TCC TTT CC-3' (FRAG. NO:1656) (SEQ ID NO:11034)

5'-GCC CTG GGG CCC CCC TGT CTT CTT GGG G-3' (FRAG. NO:1657) (SEQ ID NO:11035)

5'-CCT CTT CCC TCT GGG GGC CG-3' (FRAG. NO:1658) (SEQ ID NO:11036)

5'-TCT CTC TCC CTC TCT TGC GTC TCT C-3' (FRAG. NO:1659) (SEQ ID NO:11037)

5'-TCT TTC TCT CTC TCT CTT CCC C-3' (FRAG. NO:1660) (SEQ ID NO:11038)

55 5'-TTT CCC GCT CTT TCT GTC TC-3' (FRAG. NO:1661) (SEQ ID NO:11039)

5'-GGT GTC TGG TTT TCT CTC TCC-3' (FRAG. NO:1662) (SEQ ID NO:11040)

5'-GCT GGC TGC CTG TCT GGC CTG CGC TCT T-3' (FRAG. NO:1663) (SEQ ID NO:11041)

5'-GGC CTG TGC TGT TCC TCC-3' (FRAG. NO:1664) (SEQ ID NO:11042)

5'-TCC GGT TCC TGT CCT CTC TGT CTG TC-3' (FRAG. NO:1665) (SEQ ID NO:11043)

60 5'-GCC CCC TCT GGG GTC TCC CTC TGG C-3' (FRAG. NO:1666) (SEQ ID NO:11044)

5'-GTG GTG GTC TTG TTG CTT-3' (FRAG. NO:1667) (SEQ ID NO:11045)

5'-GGG CTG GGC TCC GTG TCT C-3' (FRAG. NO:1668) (SEQ ID NO:11046)

5'-CBG TGC TCB TGG TGT CC-3' (FRAG. NO:1669) (SEQ ID NO:11047)

5'-GCT GBG GGB GCG TCT GCT GGC-3' (FRAG. NO:1670) (SEQ ID NO:11048)

65 **Human Leukotriene C4 Synthase Nucleic Acids and Antisense Oligonucleotide Fragments**

5'-CTCGGTBGC GCGCTCBBB TCGGGTGGG CGGTGGTBG CGCGGGCBBC CGCGBBGGC CCTGCGGCC GBGBTCBCTG
CBGGGBBBB TBGGCTTGC BCBGBCTCC CBGGGGGTG CCBGCBGCCB GTBGBGCTBC CTCGTCTTC BTGGTBCCGT
CGGTGTGGT GCBGGGGCTG TGTGTBBGG CGBGCTGGC CCGTCTGCT GCTCCTCGTG CCGCCTCGTC CTTGA TGG TA
CCGTGGGTG GGTGGCCTCG GGTGGGCGG TGGTGGGCG CGCGCGCTCG CGTGGCTCCG GCTCTCTTT CCCGGCTCCGT
CGGGCCGGGG GCGTGGTCT CCCTCGTCT TCBTGTBCC G-3' (FRAG. NO:1856) (SEQ ID NO:11238)

70 5'-GCB GCBGGBC-3' (FRAG. NO:1857) (SEQ ID NO:11239)

5'-CCCGGCTCCG-3' (FRAG. NO:1858) (SEQ ID NO:11240)

5'-CGGCCCGGG GCC-3' (FRAG. NO:1859) (SEQ ID NO:11241)

5'-CB CGCGG-3' (FRAG. NO:1860) (SEQ ID NO:11242)

- 5'-GCC CCG TCT GCT GCT CCT CGT GCC G-3' (FRAG. NO:1307)(SEQ ID NO:10685)
 5'-CCT CGT CCT TCA TGG TAC CGT CGG TGT GGT GGC-3' (FRAG. NO:1308)(SEQ ID NO:10686)
 5'-CTC GGG TGG GCC GGT GGT G-3' (FRAG. NO:1309)(SEQ ID NO:10687)
 5'-GGG CGC GCG CGC TCG CGT-3' (FRAG. NO:1310)(SEQ ID NO:10688)
 5'-GGC TCC GGC TCT TCT TTC CCG GCT CCG TCG GCC CGG GGG CCT TGG TCT C-3'(FRAG.NO:1311)(SEQ ID NO:10689)
 5'-CCT CGT CCT TCB TGG TBC CG-3' (FRAG. NO:1312)(SEQ ID NO:10690)
 5'-CTCGGTBGBG GCGCTCGBBC TCGGGTGGGC CGGTGGTGBG CGCGGCGBCB CGCGGBBGGC CCTGCGCGCC GGBGTBCCTG
 CBGGGBBBG TBGGCTGCB GCBGGBCTCC CBGGGGGTG BCBGCBGCCB GTBGBGCTBC CTCGTCCTTC BTGGTBCCGT
 CGGTGTGGTG GCBGCGGGTG TGTGTBBGG CGBGCTGG-3' (FRAG.NO:1861) (SEQ ID NO:11243)
Human Endothelin-1 Nucleic Acids and Antisense Oligonucleotide Fragments
 5'-BCCGGCGGBG CCGCCBGGT GGBCTGGGBG TGGGTTCCTC CCCGCCGTC TCBCCCBCCG CGCTGBGCTC BCGCCTBBG
 BCTGCTGTT CTGBGCTCC TTGGCBBGCC BCBBBCBGB GBGBBBBT CBTGBGCBTB TBBTCCBTTC TGBBBBBBBG
 GGBTCBBBB CCTCCCGTTC CCCGTTCGCC TGGCGCGCGC TCGGGGTTC TCGTGGGTTC CTCCCGCCG TTCTCCGGTC
 TGTGCTTT GTGGCTTCT TGTCTTTTG GCTGTTCTT TCCTGCTTGG CGTCTTTCC TTCTTTTG TGCTGGTTGTG
 GGTCCGCTGG TCCTTTGCCC TGTGTGTTT TGCTGCCCGT TCGCTGGCG CGCGCTGCGG GTTCTCTGTG GGTTCCTCC
 CGCCGTTCTC CGTCTGTTG CTTTGTGGG CTCTGTGCT TTTTGGCTGT TCTTTCTCTG CTTGGCGTCT TTCTCTTCT
 TTGTGCTCGG TTGTGGTCC GCTGGTCTT TGCCCTGTGT GTTCTGCTG-3' (FRAG. NO:1862) (SEQ ID NO:11244)
 5'-CCGGCGGBG CCGCCBGGT GGB-3' (FRAG. NO:1863) (SEQ ID NO:11245)
 5'-CCGCCBGGG-3' (FRAG. NO:1864) (SEQ ID NO:11246)
 5'-GGCGCGCGC-3' (FRAG. NO:1865) (SEQ ID NO:11247)
 5'-GTGGGTCCG-3' (FRAG. NO:1866) (SEQ ID NO:11248)
 5'-CCCGTTCGCTGGCGC-3' (FRAG. NO:1313)(SEQ ID NO:10691)
 5'-GCGCTCGGGTTCCTC-3' (FRAG. NO:1314)(SEQ ID NO:10692)
 5'-GTGGGTTTCTCCCGCGTTC-3' (FRAG. NO:1315)(SEQ ID NO:10693)
 5'-CGGTCTGTTGCTTTGTGGG-3' (FRAG. NO:1316)(SEQ ID NO:10694)
 5'-CTTCTGTCTTTTGGCT-3' (FRAG. NO:1317)(SEQ ID NO:10695)
 5'-GTTCTTTCTGCTGGC-3' (FRAG. NO:1318)(SEQ ID NO:10696)
 5'-GTCTTTTCTTTCTT-3' (FRAG. NO:1319)(SEQ ID NO:10697)
 5'-TGTGCTCGGTGTGGGTC-3' (FRAG. NO:1320)(SEQ ID NO:10698)
 5'-CGCTGCTCCTTTGCC-3' (FRAG. NO:1321)(SEQ ID NO:10699)
 5'-CTGTGTGTTCTGCTG-3' (FRAG. NO:1322)(SEQ ID NO:10700)
 5'-CCGCTCGCTGGCGC-3' (FRAG. NO:1323)(SEQ ID NO:10701)
 5'-GCGCTCGGGTTCCTC-3' (FRAG. NO:1324)(SEQ ID NO:10702)
 5'-GTGGGTTTCTCCCGCGTTC-3' (FRAG. NO:1325)(SEQ ID NO:10703)
 5'-CGGTCTGTGCTTTGTGGG-3' (FRAG. NO:1326)(SEQ ID NO:10704)
 5'-CTTCTGTCTTTTGGCT-3' (FRAG. NO:1327)(SEQ ID NO:10705)
 5'-GTTCTTTCTGCTGGC-3' (FRAG. NO:1328)(SEQ ID NO:10706)
 5'-GTCTTTCTTTCTT-3' (FRAG. NO:1329)(SEQ ID NO:10707)
 5'-TGTGCTCGGTGTGGGTC-3' (FRAG. NO:1330)(SEQ ID NO:10708)
 5'-CGCTGCTCTTTGCC-3' (FRAG. NO:1331)(SEQ ID NO:10709)
 5'-CTGTGTGTTCTGCTG-3' (FRAG. NO:1332)(SEQ ID NO:10710)
Endothelin Receptor ET-B Nucleic Acids and Antisense Oligonucleotide Fragments
 5'-GCCCTGTGCG GCGGAAGCC TCTCTCTCT CCCAGATC CGCGACAGG CGCAGGCAAG AACCAGCGCA ACCAGGGCGC
 GTCCGACAG ACTTGAGGC GGCTGCATGC TGCTACCTGC TCCAGAAGCG TCCGGTGGCC GCGCGCC CTGTGGGCG
 GGBBGCCTCT CTCCTCTCC CBGTCCGCG BCBGGCCGB GGBBGBBCC BCGCBBCB GGGCGGTCC GCBGBBCTT
 GGBGGCGCT CBGTGCTCT BCCTGCTCGGCG GGBBGCCTCC GTGCGCGCG CGCTCCGGT GGCGCGCGC CTCTCTCTCT
 CTCCCGTGG CCTGTGCGG CGGGTCTGC CGTCTGTCT CTTTCTTT TGCTGTCTTG TCTCCCGTC TGTCTTT-3' (FRAG.
 NO: 1867) (SEQ ID NO:11249)
 5'-CGGGCG GBBGCC-3' (FRAG. NO: 1868) (SEQ ID NO:11250)
 5'-CGGGCGGG-3' (FRAG. NO: 1869) (SEQ ID NO:11251)
 5'-CCGCBGBGC-3' (FRAG. NO: 1870) (SEQ ID NO:11252)
 5'-GCGTCCGGTGGCGCCGC-3' (FRAG. NO:1333)(SEQ ID NO:10711)
 5'-GCCCTCTCTCTCTCC-3' (FRAG. NO:1334)(SEQ ID NO:10712)
 5'-GTGGCCCTGTGCGGGGG-3' (FRAG. NO:1335)(SEQ ID NO:10713)
 5'-TCCTGCCCTCTGTCTCTTT-3' (FRAG. NO:1336)(SEQ ID NO:10714)
 5'-TCTTTGCTGTCTGT-3' (FRAG. NO:1337)(SEQ ID NO:10715)
 5'-CTTCCCGTCTGCTTT-3' (FRAG. NO:1338)(SEQ ID NO:10716)
 5'-GCCCTGTGCG GCGGAAGCC TCTCTCTCT CCCAGATC CGCGACAGG CGCAGGCAAG AACCAGCGCA ACCAGGGCGC
 GTCCGACAG ACTTGAGGC GGCTGCATGC TGCTACCTGC TCCAGAAGCG TCCGGTGGCC GCCGC-3' (FRAG. NO: 1871) (SEQ
 ID NO:11253)
 5'-GCCCTGTGCG GCGGGBBGC TCTCTCTCT CCCBGBTCC GCBGBGGCC GCBGGCBGB BCCBGCGB BCCGGGCGC
 GTCCGCBGB BCTTGBBGC GGCTGCATGC TGCTACCTGC TCCBGBBGC TCCGGTGGCC GCCGC-3' (FRAG. NO: 1872) (SEQ
 ID NO:11254)
Endothelin ETA Receptor Nucleic Acids and Antisense Oligonucleotide Fragments
 5'-GTCTGCTCTC CCGTCTCT CCACTGCTT CTCCCGGGG CTCCCGGCG TTCGGGTGG CGGTGTCGG GGTCCGGCG
 CGGCGCGCG TTCGCTGCG GGTGGGTGG GCGGGCTGCC GGTCCGCG GCGCCTGG CCCTGTGCT GCTTTTGTG
 TGTTCGTT TGGCTGCTC GGTCTGTGT GTGTTGTTT TGTCTTCT TGGGTGTGG CCTTGGCGT TGGCTGTGG
 GCCCTTTGG GCCTTGGCT CTGGCTCGT TGTCTCTCC ACTGCTCT CCCGGGGCT TCCCGGCT
 CGGGTGGCG GTGTCCGGG CTCCGCGCG GCGGCGCTT CGGCTGCGG TGGGTGGCG GGGCTGCCG GTCCGCGCG
 CGCTGGGCT CTTGTGCTG TTTTGTCTG TTCCGTCTG GCTGCTCGG TGTGTGTGT GGTGTGTTG TTCTTCTG
 GGTGTGGCC TTGCGTTT GGCTGTGGG CCTTGGGCG CTGCTTCT GGCTCCAT CCACATGAT GCTTAGATT
 TGCTGTATC TCTAGGATT ATCAGTATT ACACATCAA CCAGTCCAG CCAAAAGGAT GCCCTGAGG AAGCGGTTT
 CATCTGAGG CAAATTGAG GACBTCCBC BTGTTGCTT BGBTTGTG TGTCTCTC BGGTTTBCB CTGTTTBCB

- BTCCBBCCBG TGCCBGCCBB BBGGBTGCCC TGBGGCBBBG GGTTCBCTC TTGBGGCBBB TTTGBGG-3' (FRAG. NO:1873)
(SEQ ID NO:11255)
5'-GBGGCBBBGGG-3' (FRAG. NO:1874) (SEQ ID NO:11256)
5'-GCCBCCBB BBGG-3' (FRAG. NO:1875) (SEQ ID NO:11257)
5'-CGCCTGGGCC C-3' (FRAG. NO:1876) (SEQ ID NO:11258)
5'-GTCTGTCTCCCGTCTCCTCC-3' (FRAG. NO:1339)(SEQ ID NO:10717)
5'-ACTGCTTCTCCCGGG-3' (FRAG. NO:1340)(SEQ ID NO:10718)
5'-GCTTCCCGGCTTC-3' (FRAG. NO:1341)(SEQ ID NO:10719)
5'-GGGTGGCCGGTGTCCCGGGCTCCGGCGCGCGGC-3' (FRAG. NO:1342)(SEQ ID NO:10720)
5'-GGCTTCGGCTGC-3' (FRAG. NO:1343)(SEQ ID NO:10721)
5'-GGGTGGGTGGCGCGG-3' (FRAG. NO:1344)(SEQ ID NO:10722)
5'-GCTCCCGGGTCCGCGCGCGCTGGGCC-3' (FRAG. NO:1345)(SEQ ID NO:10723)
5'-CTTGTGCTGCTTTT-3' (FRAG. NO:1346)(SEQ ID NO:10724)
5'-TGCTTGTCCGTC-3' (FRAG. NO:1347)(SEQ ID NO:10725)
5'-TGGCTGCTCCGGTCTGTGTGTGGTGTGTTG-3' (FRAG. NO:1348)(SEQ ID NO:10726)
5'-TTTCTTCTTGGGTGTGGG-3' (FRAG. NO:1349)(SEQ ID NO:10727)
5'-CCTTGGCGTTTGG-3' (FRAG. NO:1350)(SEQ ID NO:10728)
5'-CTGTGGGCCCTTTG-3' (FRAG. NO:1351)(SEQ ID NO:10729)
5'-GGGCCCTTGGCTTCTGGCTC-3' (FRAG. NO:1352)(SEQ ID NO:10730)
5'-CATCCACATG ATTGCTTAGA TTTGTGCTGT ATCTCTCAGG ATTATCACTG ATTACACATC CAACCACTGC CAGCCAAAAG
GATGCCCTGA GGCAAAAGGT TTCCATCTTG AGGCAAAATT GAGGA-3' (FRAG. NO:1353) (SEQ ID NO:10731)
5'-CBTCCBCBTG BTTCCTTBGB TTTGTGCTGT BTCTCTCBGG BTBTCTCBCTC CBBCCBGTGC CBGCCBBBGG
GBTGCCCTGB GGCBBBGGGT TTCCBTCTTG BGGCBBBTTT GBGG-3' (FRAG. NO:1354)(SEQ ID NO:10732)
Endothelin Receptor A Nucleic Acid and Antisense Oligonucleotide Fragments
5'-GCCACCATGG AAACCCCTTG CCTCAGGGCA TCCTTTTGGC TGGCACTGGT TGGATGTGTA ATCAGTGATA ATCCTGAGAG
ATACAGCACA AATCTAAGCA ATCATGTGGA TGATTTCACC ACTTTTCGTG GCACAGAGCT CAGCTTCCTG GTTACCACCT
ATCAACCCAC TAATTTGGTC CTACCCAGCA ATGGCTCAAT GCACAACATAT TGCCACAGC AGACTAAAAT TACTTCAGCT
TTCAAAATACA TTAACACTGT GATATCTTG ACTATTITTA TCGTGGGAAT GGTGGGGAAT GCAACTCTGC TCAGGATCAT
TTACCAGAAC AAATGTATGA GGAATGGCCC CAACGCGCTG ATAGCCAGTC TTGCCCTTGG AGACCTTATC TATGTGGTCA
TTGATCTCCC TATCAATGTA TGGCTGGGCG CTGGCCTTTT GATCACAATG ACTTTGGCGT ATTTCTTTGC AAGCTGTTC
CCTTTTGA GAAGTCCTCG GTGGGGATCA CCGTCTCAA CCTCTGCGCT CTAGTGTG ACAGGTACAG AGCAGTTGCC
TCTGGAGTC GTTTCAGGG AATTGGGATT CCTTTGGTAA CTGCCATTGA AATTGCCTCC ATCTGGATCC TGTCTTTAT
CCTGGCCATT CTGAAGCGA TTGGCTTCGT CATGGTACCC TTGAATATA GGGGTGGACA GCATAAAACC TGTATGCTCA
ATGCCACATG AAAATTCTAG GAGTTCTACC AAGATGTAAA GGACTGGTGG CTCTTCGGGT TCTATTCTG TATGCCCTTG
GTGTGCACTG CGATCTTCTA CACCTCATG ACTGGTGAGA TTTGAACAG AAGGAATGGC AGCTTGAGAA TTGCCCTCAG
TGAACATCTT AAGCAGCGTC GAGAAGTGGC AAAAACAGTT TTCTGCTTGG TTGTAATTTT TGCTCTTTGC TGGTTCCCTC
TTCAATTAAG CCGTATATTG AAGAAAACCTG TGTATAACGA GATGGACAAG AACCGATGTG AATTACTTAG TTCTTACTG
CTCATGGATT ACATCGGTAT TAACTTGGCA ACCATGAATT CATGTATAAA CCCCATAGCT CTGTATTTTG TGAGCAAGAA
ATTTAAAAAT TGTTCCAGT CATGCCCTCT CTGCTGCTGT TACCAGTCCA AAAGTCTGAT GACCTCGGTC CCCATGAACG
GAACAAGCAT CCAGTGGAAG AACCACGATC AAAACAACCA CAACACAGAC CGGAGCAGCC ATAAGGACAG CATGAACATGA
CCACCCCTAG AAGCACTCCT GAATTCGGGA AAAAGTGAAG GTGTAAAAGC AGCACAAGTGA CAATAAGAGA TATTTCTCTA
AATTGGCTC AAGATGGAAG CCCTTTGCCT CAGGCGATCC TTTTGGCTGG CACTGGTTGG ATGTGTAATC AGTGATAATC
CTGAGAGATA CAGCACAAT CTAAGCAATC ATGTGATGA TTACCACT TTCTGTTGCA CAGAGCTCAG CTTCCTGGTT
ACCACTCATC AACCACATAA TTTGGTCTA CCCAGCAATG GCTCAATGCA CAATATTGC CCACAGCAGA CTAAATTAAC
TTCACTTTT ACATGATTA ACACGTGAT ATCTGTACT ATTTTCTATC TGGGAATGGT GGGGAATGCA ACTCTGCTCA
GGATCATTTA CCAGAACAAA TGTATGAGGA ATGGCCCCAA CGCGCTGATA GCCAGTCTTG CCCTTGGAGA CCTTATCTAT
GTGGTCATTG ATCTCCCTAT CAATGTATT AAGCTGCTGG CTGGGCGCTG GCCTTTTGTAT CACAATGACT TTGGCGTATT
TCTTTGCAAG CTGTTCCCT TTTTGCAGAA GTCTCGGTG GGGATCACCG TCCTCAACCT CTGCGTCTT AGTGTGAGC
GGTACAGAGC AGTTGGCTCC TGGAGTGGT TTCAGGGAAT TGGGATTCTT TTGGTAACTG CCAATTGAAAT TGTCTCCATC
TGGATCCTGT CCTTATCTT GGCCATTCTT GAAGCGATTG GCTTCGTCTAT GGTACCCCTT GAATATAGGG GTGAACAGCA
TAAACCTGT ATGTCTAATG CCACATCAAA ATTCATGGAG TTCTACCAAG ATGTAAAGGA CTGGTGGCTC TTCGGGTTCT
ATTTCTGTAT GCCCTTGGTG TGCACTGCGA TCTTCTACAC CCTCATGACT TGTGAGATGT TGAACAGAA GAATGGCAGC
TTGAGAATTG CCTCAGTGA ACATCTTAAG CAGCGTCGAG AAGTGGCAAA AACAGTTTTC TGCTTGGTTG TAATTTTTCG
TCTTTGCTGG TTCCCTCTTC ATTTAAGCCG TATATTGAAG AAAAGTGTGT ATAACGAGAT GGACAAGAAC CGATGTGAAT
TACTTAGITT CTACTGCTC ATGGATTACA TCGGATTAA CTGGCAACC ATGAATTCAT GTATAAAGCC CATAGCTCTG
TATTTTGTGA GCAAGAAAT TAAAAATTGT TTCCAGTCAT GCCTCTGCTG CTGCTGTTAC CAGTCCAAAA GTCTGATGAC
CTCGGTCCCC ATGAACGGAA CAAGCATCCA GTGGAAGAAC CACGATCAAA ACAACCACAA CACAGACCGG AGCAGCCATA
AGGACAGCAT GAACTGACCA CCCTTAGAAG CACTCTCTCG TACTCCATA ATCTCTCGG AGAAAAAAT CACAAGGCAA
CTGTGAGTCC GGGAACTCT TCTCTGATCC TTCTTCTTA ATTCACTCC ACACCAAGA AGAAATGCTT TCCAAAAACCG
CAAGGGTAGA CTGGTTTATC CACCCACAAC ATCTACGAAT CGTACTTCT TAATTGATCT AATTACATA TTCTGGGTG
TGTATTACAG ACTAAAAAAT GGTGGGAGCT GGGGGAGAAT GAAGACTGTT AAATGAAACC AGAAGGATAT TTACTACTTT
TGCAATGAAA TAGAGCTTTC AAGTACATGG CTAGCTTTTA TGGCACTTCT GGTGAATGTT CAATGGGAAC TGGTACCAT
GAAACTTTAG AGATTAACGA CAAGATTTC TACTTTTTT AAGTGAATTT TTGTCTTTC AGCCAAACAC AATATGGGCT
CAAGTCACCT TTATTTGAAA TGTCATTGG TGCCAGTATC CCGAATTC GAATTCGGGA AAAAGTGAAG GTGTAAAAGC
AGCACAAGTG CAATAAGAGA TATTTCTCA AATTGCTCTC AAGATGGAAA CCCTTTGCCT CAGGGCATCC TTTTGGCTGG
CACTGGTTGG ATGTGTAATC AGTGATAATC CTGAGAGATA CAGCACAAT CTAAGCAATC ATGTGATGA TTTACACCAT
TTTCGTGGCA CAGAGCTCAG CTTCCTGGTT ACCACTCATC AACCACATAA TTTGGTCTA CCCAGCAATG GCTCAATGCA
CAACTATTGC CCACAGCAGA CTAAATTTAC TTCAGTTTC AAATACATTA AACTGTGAT ATCTTGTACT ATTTTATCG
TGGGAATGGT CGGGAATGCA ACTCTGCTCA GGATCATTTA CCAGACAATA TGTATGAGGA ATGGCCCCAA
GCCAGCTTTC CCCTTGGAGA CCTTATCTAT GTGTCAATTG ATCTCCCTAT CAATGTATT AAGCTGCTGG CTGGGCGCTG
GCCTTTGAT CACAATGACT TTGGCGTATT TCTTGCAG CTGTCCCTT TTTTGCAGAA GTCTCTGGTG GGGATCACCG
TCTCAACCT CTGCGCTCTT AGTGTGACA GGTACAGAGC AGTTGCCTCC TGGAGTCGT TACAGGGAAT TGGGATTCT
TTGGTAACTG CCATTGAAAT TGTCTCCATC TGTATCTCT CCTTATCTCT GGCCATTCTT GAAGCGATG TCTCTGCT
GGTACCTTT GAATATAGGG GTGAACAGCA TAAACCTGT ATGCTCAATG CCACATCAAA ATTCATGGAG TTCTACCAAG
ATGTAAAGGA CTGGTGCTC TTCGGTTCT ATTTCTGTAT GCCCTTGGT TGCATGCGA TCTTCTACAC CCTCATGACT

TGTGAGATGT TGAACAGAAG GAATGGCAGC TTGAGAATTG CCCTCAGTGA ACATCTTAAG CAGCGTCGAG AAGTGGCAAA
 AACAGTTTTC TGCTTGGTTG TAATTTTTCG TCTTTGCTGG TTCCCTCTTC ATTAAAGCCG TATATTGAAG AAAACTGTGT
 ATAACGAGAT GGACAAAGAAC CGATGTGAAT TACTTAGTTT CTACTTGCTC ATGGATTACA TCGGTATTAA TTGGCAACC
 ATGAATTCAT GTATAAACC CATAGCTCTG TATTTTGTGA GCAAGAAAT TAAAAATTGT TTCCAGTCAT GCCTCTGCTG
 5 CTGCTGTITAC CAGTCCAAAA GTCTGATGAC CTCGGTCCCC ATGAACGGAA CAAGCATCCA GTGGAAAGAAC CACGATCAAA
 ACAACCACAA CACAGACCGG AGCAGCCATA AGGACAGCAT GAATGACCA CCCTTAGAAG CACTCCTCGG TACTCCATA
 ATCCTCTCGG AGAAAAAAT CACAAGGCAA CTGTGAGTCC GGAATCTCT TCTCTGATCC TTCTTCTTA ATCTACTCCC
 ACACCCAAGA AGAAATGCTT TCCAAAACCG CAAGGGTAGA CTGGTTTATC CACCCACAAC ATCTACGAAT CGTACTTCTT
 TAATTGATCT AATTTACATA TTCTGCGTGT TGTATTGAGC ACTAAAAAAT GGTGGGAGCT GGGGGAGAAT GAAGACTGTT
 10 AAATGAAACC AGAAGGATAT TTAATCTTT TGCATGAAAA TAGAGCTTTC AAGTACATGG CTAGCTTTTA TGGCAGTTCT
 GGTGAATGTT CAATGGGAAC TGGTCACCAT GAAACTTTAG AGATTAACGA CAAGATTTTC TACTTTTTT AAGTGATTTT
 TTTGCTCTC AGCCAAACAC AATATGGGCT CAAGTCACTT TTAATTGAAA TGTCATTGG TGCCAGTATC CCGAATTC-3' (FRAG.
 NO:) (SEQ ID NO:12383)
 5'-GAATTCGGGA AAAAGTGAAG GTGTAAAAGC AGCACAAGTG CAATAAGAGA TATTTCTCA AATTTGCCTC AAGATGGAAA
 15 CCCTTTGGCT CAGGGCATCC TTTTGGCTGG CACTGGTGG ATGTGTAATC AGTGATAATC CTGAGAGATA CAGCACAAT
 CTAAGCAATC ATGTGGATGA TTTCAACACT TTTCGTGGCA CAGAGCTCAG CTTCCTGGTT ACCACTCATC AACCACATA
 TTTGGTCTTA CCCAGCAATG GCTCAATGCA CAACATTTGC CCACAGCAGA CTAAAAATTAC TTACAGTTTC AAATACATTA
 AACTGTGAT ATCTTGTACT ATTTTCATCG TGGGAATGGT GGGGAATGCA ACTCTGCTCA GGATCATTTA CCAGAACAAA
 TGTATGAGGA ATGGCCCCAA CGCGCTGATA GCCAGTCTTG CCCTTGGAGA CCTTATCTAT GTGGTCATTG ATCTCCCTAT
 20 CAATGTATTT AAGCTGCTGG CTGGGCGCTG GCCTTTTGT CACAATGACT TTGGCGTATT TCTTTGCAAG CTGTTCCCT
 TTTTGCAGAA GTCTCGGTG GGGATCACCG TCCTCAACCT CTGCGCTCTT AGTGTGACA GGTACAGAGC AGTTGCCCTC
 TGGAGTCGTG TTCAGGGAAT TGGGATTCCT TTGGTAACTG CCATTGAAAT TGTCTCCATC TGGATCCTGT CCTTTATCCT
 GGCCATTCTT GAAGCGATTG GCTTCGTCAT GGTACCTTT GAATATAGGG GTGAACAGCA TAAACCTGT ATGCTCAATG
 CCACATCAAA ATTCATGGAG TTCTACCAAG ATGTAAGGA CTGGTGGCTC TTGGGTTCT ATTTCTGTAT CCCTTGGTG
 25 TGCATGCGA TCTTCTACAC CCTCATGACT TGTGAGATGT TGAACAGAAG GAATGGCAGC TTGAGAATTG CCCTCAGTGA
 ACATCTTAAG CAGCGTCGAG AAGTGGCAAA AACAGTTTTC TGCTTGGTTG TAATTTTTCG TCTTTGCTGG TTCCCTCTTC
 ATTTAAGCCG TATATTGAAG AAACTGTGT ATAACGAGAT GGACAAGAAC CGATGTGAAT TACTTAGTTT CTACTGCTC
 ATGGATTACA TCGGTATTAA CTGGCAACC ATGAATTCAT GTATAAACCC CATAGCTCTG TATTTGTGA GCAAGAAAT
 TAAAAATTGT TTCCAGTCAT GCCTCTGCTG CTGCTGTAC CAGTCCAAAA GTCTGATGAC CTCGGTCCCC ATGAACGGAA
 30 CAAGCATCCA GTGGAAAGAAC CACGATCAAA ACAACCACAA CACAGACCGG AGCAGCCATA AGGACAGCAT GAACTGACCA
 CCCTTAGAAG CACTCCTCGG TACTCCATA ATCCTCTCGG AGAAAAAAT CACAAGGCAA CTGTGAGTCC GGAATCTCT
 TCTCTGATCC TTCTTCTTA ATCTACTCCC ACACCAAGA AGAAATGCTT TCCAAAACCG CAAGGGTAGA CTGGTTTATC
 CACCCACAAC ATCTACGAAT CGTACTTCTT TAATTGATCT AATTACATA TTCTGCGTGT TGTATTGAGC ACTAAAAAAT
 GGTGGGAGCT GGGGGAGAAT GAAGACTGTT AAATGAAACC AGAAGGATAT TTAATCTTT TGCATGAAAA TAGAGCTTTC
 35 AAGTACATGG CTAGCTTTTA TGGCAGTTCT GGTGAATGTT CAATGGGAAC TGGTCACCAT GAAACTTTAG AGATTAACGA
 CAAGATTTTC TACTTTTTT AAGTGATTTT TTTGCTCTC AGCCAAACAC AATATGGGCT CAAGTCACTT TTAATTGAAA
 TGTCATTGG TGCCAGTATC CCGAATTC-3' (FRAG. NO:) (SEQ ID NO:11851)
 5'-GAATTCGGGA AAAAGTGAAG GTGTAAAAGC AGCACAAGTG CAATAAGAGA TATTTCTCA AATTTGCCTC AAGATGGAAA
 40 CCCTTTGGCT CAGGGCATCC TTTTGGCTGG CACTGGTGG ATGTGTAATC AGTGATAATC CTGAGAGATA CAGCACAAT
 CTAAGCAATC ATGTGGATGA TTTCAACACT TTTCGTGGCA CAGAGCTCAG CTTCCTGGTT ACCACTCATC AACCACATA
 TTTGGTCTTA CCCAGCAATG GCTCAATGCA CAACATTTGC CCACAGCAGA CTAAAAATTAC TTACAGTTTC AAATACATTA
 AACTGTGAT ATCTTGTACT ATTTTCATCG TGGGAATGGT GGGGAATGCA ACTCTGCTCA GGATCATTTA CCAGAACAAA
 TGTATGAGGA ATGGCCCCAA CGCGCTGATA GCCAGTCTTG CCCTTGGAGA CCTTATCTAT GTGGTCATTG ATCTCCCTAT
 45 CAATGTATTT AAGCTGCTGG CTGGGCGCTG GCCTTTTGT CACAATGACT TTGGCGTATT TCTTTGCAAG CTGTTCCCT
 TTTTGCAGAA CTGCTCGGTG GGGATCACCG TCCTCAACCT CTGCGCTCTT AGTGTGACA GGTACAGAGC AGTTGCCCTC
 TGGAGTCGTG TTCAGGGAAT TGGGATTCCT TTGGTAACTG CCATTGAAAT TGTCTCCATC TGGATCCTGT CCTTTATCCT
 GGCCATTCTT GAAGCGATTG GCTTCGTCAT GGTACCTTT GAATATAGGG GTGAACAGCA TAAACCTGT ATGCTCAATG
 CCACATCAAA ATTCATGGAG TTCTACCAAG ATGTAAGGA CTGGTGGCTC TTGGGTTCT ATTTCTGTAT CCCTTGGTG
 50 TGCATGCGA TCTTCTACAC CCTCATGACT TGTGAGATGT TGAACAGAAG GAATGGCAGC TTGAGAATTG CCCTCAGTGA
 ACATCTTAAG CAGCGTCGAG AAGTGGCAAA AACAGTTTTC TGCTTGGTTG TAATTTTTCG TCTTTGCTGG TTCCCTCTTC
 ATTTAAGCCG TATATTGAAG AAACTGTGT ATAACGAGAT GGACAAGAAC CGATGTGAAT TACTTAGTTT CTACTGCTC
 ATGGATTACA TCGGTATTAA CTGGCAACC ATGAATTCAT GTATAAACCC CATAGCTCTG TATTTGTGA GCAAGAAAT
 TAAAAATTGT TTCCAGTCAT GCCTCTGCTG CTGCTGTAC CAGTCCAAAA GTCTGATGAC CTCGGTCCCC ATGAACGGAA
 55 CAAGCATCCA GTGGAAAGAAC CACGATCAAA ACAACCACAA CACAGACCGG AGCAGCCATA AGGACAGCAT GAACTGACCA
 CCCTTAGAAG CACTCCTCGG TACTCCATA ATCCTCTCGG AGAAAAAAT CACAAGGCAA CTGTGAGTCC GGAATCTCT
 TCTCTGATCC TTCTTCTTA ATCTACTCCC ACACCAAGA AGAAATGCTT TCCAAAACCG CAAGGGTAGA CTGGTTTATC
 CACCCACAAC ATCTACGAAT CGTACTTCTT TAATTGATCT AATTACATA TTCTGCGTGT TGTATTGAGC ACTAAAAAAT
 GGTGGGAGCT GGGGGAGAAT GAAGACTGTT AAATGAAACC AGAAGGATAT TTAATCTTT TGCATGAAAA TAGAGCTTTC
 AAGTACATGG CTAGCTTTTA TGGCAGTTCT GGTGAATGTT CAATGGGAAC TGGTCACCAT GAAACTTTAG AGATTAACGA
 60 CAAGATTTTC TACTTTTTT AAGTGATTTT TTTGCTCTC AGCCAAACAC AATATGGGCT CAAGTCACTT TTAATTGAAA
 TGTCATTGG TGCCAGTATC CCGAATTC-3' (FRAG. NO:) (SEQ ID NO:11839)
 5'-GCCACCATGG AAACCTTTTG CCTCAGGGCA TCCTTTTGGC TGGCACTGGT TGGATGTGTA ATCAGTGATA ATCTGAGAG
 ATACAGCACA AATCTAAGCA ATCATGTGGA TGATTTTACC ACTTTTCGTG GCACAGAGCT CAGCTTCCTG GTTACCACTC
 65 ATCAACCCAC TAATTTGGTC CTACCCAGCA ATGGCTCAAT GCACAACTAT TGCCACAGC AGACTAAAA TACTTCAGCT
 TTCAAAATACA TTAACACTGT GATATCTTGT ACTATTTC TCGTGGGAAT GGTGGGGAAT GCAACTCTGC TCAGGATCAT
 TTACAGAAAC AAATGTATGA GGAATGGCCG CAACGCGCTG ATAGCCAGTC TTGCCCTTGG AGACCTTATC TATGTGGTCA
 TTGATCTCCC TATCAATGTA TGGCTGGGCG CTGGCCTTTT GATCACAATG ACTTTGGCGT ATTCTTTGCG AAGCTGTTCC
 CCTTTTGTCA GAAGTCTCG GTGGGATCA CCGTCTCAA CCTCTGCGCT CTTAGTGTG ACAGGTACAG AGCAGTTGCC
 TCTGTGAGTC GTGTTGAGG AATTGGGAT CCTTTGGTAA CTGCCATTGA AATTGCCTCC ATCTGGATCC TGTCTTTAT
 70 CCTGGCCATT CCTGAAGCGA TTGGCTTCGT CATGGTACCC TTGGAATATA GGGGTGGACA GCATAAAACC ATGATCTCA
 ATGCCACATC AAAATTCATG GAGTTCTACC AAGATGTAAG GGAAGTGGT CTTCTCGGT TCTATTCTG TATGCCCTG
 GTGTGCACTG CGATCTCTCA CACCTCATG ACTGGTGAAG TGTGAACAG AAGGAATGGC AGCTTGAGAA TTGCCCTCAG
 TGAACATCTT AAGCAGCGTC GAGAAGTGGC AAAAACAGTT TCTGCTTGG TTGTAATTTT TGCTCTTGC TGGTCCCTC
 75 TTCATTAAAG CCGTATATTG AAGAAAACTG TGTATAACGA GATGGACAAG AACCGATGTG AATTACTTAG TTTCTTACTG
 CTCATGGATT ACATCGGTAT TAACCTGGCA ACCATGAATT CATGTATAAA CCCCATAGCT CTGTATTTTG TGAGCAAGAA

ATTAAAAAT TGTTCCAGT CATGCCTCTG CTGCTGCTGT TACCAGTCCA AAAGTCTGAT GACCTCGGTC CCCATGAACG
GAACAAGCAT CCAGTGGAAG AACCACGATC AAAACAACCA CAACACAGAC CGGAGCAGCC ATAAGGACAG CATGAAGTGA
CCACCCCTTAG AAGCACTCCT-3' (FRAG. NO:) (SEQ ID NO:12486)

Substance P Antisense Nucleic Acids and Oligonucleotide Antisense Oligonucleotide Fragments

- 5 5'-CTGCTGBGGC TTGGGTCTCC GGGCGBTCT CTGCBGBBGB TGCTCBBBGG GCTCCGGCBG TTCCTCCTTG BTCTGGTCGCT
GTCGTBCCBG TCGGBCCBG BBTTCBGBTC BTCBTGGCT CBTBTCTT CTGCBBCBG CTGBGTGGBG BCBBGBBBB
BGBCTGCCBB GGCCBCBGG BTTTCBTGT TGGBTTCG GBCGGBCBGT CCCGCGGGT GCTGAGTTCT TCTGGTCTCT
CCGBGCGCBG GTGGTCGCTC CGCGTTCTC TGGTTCCTCC GGTCCCGCGG GGTGCTGTCT GGTGCTGTCT GTGGCTGGG
TCTCCGGGCG GTTCTCTCC TTTCCGC-3' (FRAG. NO:1877) (SEQ ID NO:11259)
- 10 5'-CTCC GGGCGB-3' (FRAG. NO:1878) (SEQ ID NO:11260)
5'-GGCCBCBGG-3' (FRAG. NO:1879) (SEQ ID NO:11261)
5'-GGGTCTCCGGCG-3' (FRAG. NO:1880) (SEQ ID NO:11262)
5'-GGG TCTCCGGGCG G-3' (FRAG. NO:1881) (SEQ ID NO:11263)
5'-CGTGGTCTCCGC-3' (FRAG. NO:1355)(SEQ ID NO:10733)
- 15 5'-GTTTCTCTGGTTCCTCCG-3' (FRAG. NO:1356)(SEQ ID NO:10734)
5'-GTCCCGCGGGTGCTG-3' (FRAG. NO:1357)(SEQ ID NO:10735)
5'-TCTGGTCTGCTGCT-3' (FRAG. NO:1358)(SEQ ID NO:10736)
5'-GGCTTGGGTCTCCGGGCG-3' (FRAG. NO:1359)(SEQ ID NO:10737)
5'-GTTTCTCTCTTTTCCGC-3' (FRAG. NO:1360)(SEQ ID NO:10738)
- 20 5'-CTGCTGBGGC TTGGGTCTCC GGGCGBTCT CTGCBGBBGB TGCTCBBBGG GCTCCGGCBG TTCCTCCTTG BTCTGGTCGCT
GTCGTBCCBG TCGGBCCBG BBTTCBGBTC BTCBTGGCT CBTBTCTT CTGCBBCBG CTGBGTGGBG BCBBGBBBB
BGBCTGCCBB GGCCBCBGG BTTTCBTGT TGGBTTCG GBCGGBCBGT CCCGCGGGT GCTGAGTTCT TCTGGTCTCT
CCGBGCGCB-3' (FRAG. NO:1882) (SEQ ID NO:11264)

Substance P Receptor Nucleic Acids and Antisense Oligonucleotide Fragments

- 25 5'-GGGCTBBGBT GBTCCBCBTC BCTBCCCGT TGCCCBCCBC BGBGGTCBCC BCBBTGBCCG TGTBGGCBGC TGCCBBBGG
BCBBTTTGCC BGGCTGGTTC CCBGBBCTGB TTGGGTCCG BGGTGTBTGT GGBGTGTGT GGGGBBGGT CTGBGTCCBC
CGGBGGBCG TBTCCBTTC CGBBCTBGG CGGTBBBGGC CTBCTCTG TBCBCCBCCC CCTCTGCBG CBGBGTCTG
TCGTGGCGCC TGGGGCTCBG GGTCCGGG TAAGATGAT CACATCTA CCACGTTGCC CACCACAGAG GTCACCACAA
TGACCGTGA GGCACTGCC CAAAGGACAA TTGGCCAGG TGGTGCACG AACTGATTGG GTTCCGAGGT GTTAGTGGAG
- 30 ATGTTTGGG AGAGGTCTGA GTCCACCGG AGGACGTTAT CCATTTCGAA GCTAGGCGGT AAAGCCCTAC TATCTGTACA
CAACCCCTCT CTGCAGCAGA GTCTGTCTGT GGCCTGCTGG GCTCAGGGTC GTCTCTGTCG TGCGCCTGG GGTCTCTCT
TTGTGGGCTC TTGGTGGCT GTGGCTGTGG TCTCTGTGTG TGCTGCCCTG GGTCTGGGG TGTGGCTTG GGGCCGTCT
- 35 5'-GGGCTBBGBT GBTCCBCBTC BCTBCCCGT TGCCCBCCBC BGBGGTCBCC BCBBTGBCCG TGTBGGCBGC TGCCBBBGG
BCBBTTTGCC BGGCTGGTTC CCBGBBCTGB TTGGGTCCG BGGTGTBTGT GGBGTGTGT GGGGBBGGT CTGBGTCCBC
CGGBGGBCG TBTCCBTTC CGBBCTBGG CGGTBBBGGC CTBCTCTG TBCBCCBCCC CCTCTGCBG CBGBGTCTG
TCGTGGCGCC TGGGGCTCBG GGTCCGGG TAAGATGAT CACATCTA CCACGTTGCC CACCACAGAG GTCACCACAA
TGACCGTGA GGCACTGCC CAAAGGACAA TTGGCCAGG TGGTGCACG AACTGATTGG GTTCCGAGGT GTTAGTGGAG
- 40 5'-GGGCTBBGBT GBTCCBCBTC BCTBCCCGT TGCCCBCCBC BGBGGTCBCC BCBBTGBCCG TGTBGGCBGC TGCCBBBGG
BCBBTTTGCC BGGCTGGTTC CCBGBBCTGB TTGGGTCCG BGGTGTBTGT GGBGTGTGT GGGGBBGGT CTGBGTCCBC
CGGBGGBCG TBTCCBTTC CGBBCTBGG CGGTBBBGGC CTBCTCTG TBCBCCBCCC CCTCTGCBG CBGBGTCTG
TCGTGGCGCC TGGGGCTCBG GGTCCGGG TAAGATGAT CACATCTA CCACGTTGCC CACCACAGAG GTCACCACAA
TGACCGTGA GGCACTGCC CAAAGGACAA TTGGCCAGG TGGTGCACG AACTGATTGG GTTCCGAGGT GTTAGTGGAG
- 50 5'-GGGCTBBGBT GBTCCBCBTC BCTBCCCGT TGCCCBCCBC BGBGGTCBCC BCBBTGBCCG TGTBGGCBGC TGCCBBBGG
BCBBTTTGCC BGGCTGGTTC CCBGBBCTGB TTGGGTCCG BGGTGTBTGT GGBGTGTGT GGGGBBGGT CTGBGTCCBC
CGGBGGBCG TBTCCBTTC CGBBCTBGG CGGTBBBGGC CTBCTCTG TBCBCCBCCC CCTCTGCBG CBGBGTCTG
TCGTGGCGCC TGGGGCTCBG GGTCCGGG TAAGATGAT CACATCTA CCACGTTGCC CACCACAGAG GTCACCACAA
TGACCGTGA GGCACTGCC CAAAGGACAA TTGGCCAGG TGGTGCACG AACTGATTGG GTTCCGAGGT GTTAGTGGAG

Chymase Antisense Nucleic Acids and Oligonucleotides Antisense Oligonucleotide Fragments

- 5'-GGBGCTGBTB CTGCBGATT CBGBGGGBBG BBCCCTGBTB CTBCCBCTG TCBGCTCTGG BGCBCBGBG BBBBGBCBGC
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	GGCTACCCAT	TACTTTGTGA	CTTCTCACT	CTGTGACCAT	GCTCAAGAGC	TATGGAGAAA	TCTAAAAACG	TGAGGAGGAC
25	AGTGGGTCTT	ACACAGAGAC	AGAGGAGAGT	GGGCCAGGGC	AAGGTGGGAG	TGGGAGAAGT	CTGAGATGAA	AACATCAGAA
	TGAGAGCAGAG	GCAAGAAATGA	GATTTACACT	GGGAGGTTAT	GGGTGGGGAA	AGATACGAAA	TACAGGAGAC	AGGAGAGGGA
	AGATGGGCGG	AACACAGGGT	GAGAATGAGA	TCCAGGGGAA	GCCTAGCTCA	GCTTAACCC	AATTTGTCCA	TTCAATGGAG
	AGAGTATCTG	TGGCCGTGTT	CAAAACCTGG	GGTGCTCTGT	TCCAGGGGAG	ATCATCGGGG	GCACAGAATG	CAAGCCACAT
	TCCGCCCCCT	ACATGGCCCTA	CCTGGAATTT	GTAACCTCCA	ACGGTCCCTC	AAAATTTTGT	GGTGGTTTCC	TTATAAGACG
30	GAACTTTGTG	CTGACGGCTG	CTCATTTGTC	AGGAAGGTGA	GACAACAGGG	TCTATTATAT	TCCAAATGGG	AGATGAACAA
	CCAGAGTAGC	ATCCAGGAAT	ACACCTGCAC	TGGGGACTGA	ATGAGGGGCTC	CTGGGTCTTG	TCAACTTTCA	GGAGAGGGAA
	GACTTTGGGC	TGAAAGACTT	TAGTCTGTGT	TTGAATAGIT	CCTTGAGCCT	CAGTCACTGA	GCTAAGCTCC	CTTCGGAGGA
	AAAGGAGGTC	CTGTCCGAAAG	GTCCCTCTTG	TTGCAGTAGC	ACCCCTCACC	CCTACCCAAC	TCAAGACACA	CGGCTCACTT
	TTCAGGGGCT	CACCCAGTCT	CAGGGCCACT	TCTCTATGG	CCTTTCAAG	AACACTGGCT	CTAGTTCTCA	GGGTCGTGAA
35	CCCATCTATT	TATGGGAGCA	GAGAACAGGT	CTACATAAGA	CTTCCCACTT	CCCGTTTTAA	CTGATATCTC	CTGCTTCAGG
	GGCTGGCCCT	CATGCAGGGT	TCCCTGAATT	AGGAAGTGTG	AACCCGTGCC	CCTGAGTCTT	CCCTGGCCTG	TTCACTCCCC
	AGCAATTCCA	GGGGTCGTAG	AAATTGTGTC	TGTTTCTCTG	GAAAGCTCTT	TCATGAGTTA	AGCCTGAGCC	CTCAATGCC
	ACAAAGTGCC	CATGAAAAAG	GAGATGGGTA	GAGTCCGGCN	ACCCAGTGAC	AGAGTTTAGT	CCTCTTTTCT	CAGAAATGAGC
40	TCACCTCAGA	AGAAACCCCA	AGCCATCACT	GTGCGCTCCT	TTTCTCTCTT	TCTTCTCTAC	AGCAGGTCTA	TAACAGTCAC
	CCTTGGAGCC	CATAACATAA	CAGAGGAAGA	AGACACATGG	CAGAAGCTTG	AGGTTATAAA	GCAATTCGCT	CATCCAAAAA
	ATAACACTTC	TACTCTTCAC	CACGATATCA	TGTTACTAAA	GGTGACAACA	CCTCTCTTCT	CCCTTTCCAC	TTCCCAATTCT
	CCTAAGCTTC	TCCTTCAGGT	CCTCATTGCC	CTGAATTTT	CTTAGGACTT	GGCTATAACA	TGAAGCTACT	CACCCGTGCC
	CTCCCTGATC	ACCTCCAAC	GTCCAGAGCC	CATTTCGAGG	ACTGACAGTC	CTTCATTCCC	TTACAGTTG	AAGGAGAAAAG
45	CCAGCCTGAC	CCTGGCTGTG	GGGACACTCC	CCCTCCCATC	ACAATTCAAC	TTTGTCCTAC	CTGGGAGAAT	GTGCCGGGTG
	GCTGGCTGGG	GAAGAACAGG	TGTGTTGAAG	CCGGGCTCAG	ACACTCTGCA	AGAGGTGAAG	CTGAGACTCA	TGGATCCCCA
	GGCCTGCAGC	CACCTCAGAG	ACTTTGACCA	CAATCTTCAG	CTGTGTGTGG	GCAATCCAG	GAAGACAAAA	TCTGCATTTA
	AGGTGATCCT	CCAAGTAGGT	TTCTCTCCA	AAACTCACTG	TTACAGGGACC	TGAATGCTCT	TAGAAGGAGA	TGGGGTCAGC
	AGGTTGTCTG	TCAGGTGACA	GGGTGAGCAT	CACAGGAATT	GCTGTCTCTC	CGTGGTCCAA	GACAGCCTCT	GACCATCCAT
50	TCCAGTCTAT	TGCACCTGGG	GCAATGGGGT	ACTGTGGAGA	ATGTGGATGA	CGGTCCCAAG	AAAGGAAGAA	GGGGCATCAG
	AACTAGATGT	ATAAGTGAGG	AGCTCCACCT	CCTGGGTCTG	ACTTTAGGTC	TCAGTGTGAC	TCCAAAGCTGG	CTGGCAGACA
	GGAGTGGAGG	ACTTCCCGGG	CTCACCTTCT	TCTCTCTCTC	CTCCCCCTAC	AGGGAGACTC	TGGGGGCCCT	CTTCTGTGTG
	CTGGGGTGGG	CCAGGGGCATC	GTATCCTATG	GACGGTCGGA	TGCAAAAGCCC	CCTGCTGTCT	TCACCCGAAT	CTCCATTATC
	CGGCCCTGGA	TCAACCAGAT	CCTGCAGGCA	AATTAATCCT	GGATCCTGAG	CCAGCCTGAA	GGGAAGCTGG	AACTGGACCT
	TAGACGACAA	GTGTGTGCAA	CTCATTTCTG	TTCTACCCCT	GGTTCCCTCA	GCCACAACCC	TAAGCTTCCA	AGAGGTCTCC
55	TACAGGTAAC	AGAAGTTTCA	ATAAACTTCA	GTGAAGACAC	AGCTTCTAGT	CGTGAGTGTG	TGTCCTCTCT	TGCTGCTCTC
	TTCTCCTGCA	CATGTGACCT	GATTCACAGC	CCAAGCACCA	AGGA-3'	(FRAG. NO:)	(SEQ ID NO:11836)	
	5'-GGBGCBBCBG-3'	(FRAG. NO:1888)	(SEQ ID NO:11270)					
	5'-GGBGCBBCG-3'	(FRAG. NO:1889)	(SEQ ID NO:11271)					
	5'-GGGGCBBCG CG-3'	(FRAG. NO:1890)	(SEQ ID NO:11272)					
60	5'-CGTTTTCTTCTCTC-3'	(FRAG. NO:1369)	(SEQ ID NO:10747)					
	5'-GCTGGTTTTCTTCC-3'	(FRAG. NO:1370)	(SEQ ID NO:10748)					
	5'-TGGCAGTGGGTGGGGTGGGGTGGG-3'	(FRAG. NO:1371)	(SEQ ID NO:10749)					
	5'-TTCTTGTCTCTGGGGGTGCTCT-3'	(FRAG. NO:1372)	(SEQ ID NO:10750)					
	5'-CTTGCTCTGGGCTTTTCT-3'	(FRAG. NO:1373)	(SEQ ID NO:10751)					
65	5'-CCCCCTTTCTTCC-3'	(FRAG. NO:1374)	(SEQ ID NO:10752)					
	5'-TGTCTGTTTTCTTGGGG-3'	(FRAG. NO:1375)	(SEQ ID NO:10753)					
	5'-CTCTCTCTGTCTCTGTGT-3'	(FRAG. NO:1376)	(SEQ ID NO:10754)					
	5'-CCTTGCCCTGGCCC-3'	(FRAG. NO:1377)	(SEQ ID NO:10755)					
	5'-TCTTCCCTCTCTGTCTCTGT-3'	(FRAG. NO:1378)	(SEQ ID NO:10756)					
70	5'-CCCTGTGTTCGGCCC-3'	(FRAG. NO:1379)	(SEQ ID NO:10757)					
	5'-GTCTTCCCTCTCTCTG-3'	(FRAG. NO:1380)	(SEQ ID NO:10758)					
	5'-ACCTCCTTTTCTCTCCG-3'	(FRAG. NO:1381)	(SEQ ID NO:10759)					
	5'-CTGGGTGGGGCCCTG-3'	(FRAG. NO:1382)	(SEQ ID NO:10760)					
	5'-CCTGTTCTCTGCTCCC-3'	(FRAG. NO:1383)	(SEQ ID NO:10761)					
75	5'-TGGCTTGGGGTTTCTTCTG-3'	(FRAG. NO:1384)	(SEQ ID NO:10762)					

- 5'-TGTTGCTTCTTCTCTGTT-3' (FRAG. NO:1385)(SEQ ID NO:10763)
5'-GGCTGGCTTCTCTTC-3' (FRAG. NO:1386)(SEQ ID NO:10764)
5'-TTTGTCTTCTGGG-3' (FRAG. NO:1387)(SEQ ID NO:10765) [1397]
5'-TGCCCTTCTTCTTCTTGGG-3' (FRAG. NO:1388)(SEQ ID NO:10766)
5'-TCCTTGGTCTTGGGCTGGG-3' (FRAG. NO:1389)(SEQ ID NO:10767)
5'-GGBGCTGBTB CTGCBGATT CBGBGGGBB BBCCCTGBTB CTCBCBGCT TCBGCTCTGG BGCBCBBGBG BBBBGBCBGC
BGGGGGBGBG GBBGBBGBG CBTCTTCCB GBGBGGCTGC CTGBGCBBT GCTGGTTTC CTTCBGC TCCTGGTTTB
TBBCTCCCBG BBGGCBGBG BGGGGCBGG-3' (FRAG.NO:1891) (SEQ ID NO:11273)
- Endothelial Nitric Oxide Synthase Nucleic Acids and Antisense Oligonucleotide Fragments**
- 10 5'-GCGTCTGGG GTGCBGGGC CBTCTGCTG CGCCTGGCG CTGCTGTGC TCCGTCTGCT GGGGGCCGG GTTGGCTGGG
CCCTGCTTGC CGACAGACC CGGGCCGACC CGAGGCTCGG GGGGCTGTGT TCTGGCGCTG GTGGGCTTGG GCCCCTCTGG
GGGCTGGGT TCTGTCTGC CTTGGGCGCT GCGTCTTGG GGTGCGGGGC CGGGGGGCCG GGGGGCCGCT GTTGGTGGGC
CTGGGGGTGC CTGTGGCTGC CGGTTGCCCG GGTGGTGGC GCGTCTCTGC TGGCGTCTGT TGGCTGGGTC CCCCCCGCCG
TTTCTGGG TCCGCGTGG GTGCTCCGGT TCCTGTGTC GGTGCTGCCT TGTCTTCCG GCGGTGGCG CGTGGTGGTC
15 CGCCCCCCT GGCTTCTGC TCGGGGTCTG GCTGGTGGC GGTGCCCTTG GCGCGGTCT TCTTCTGCT GGCTCTGGGC
CGGGCCGGT TCGGGCGTCT CGTGTCTGCT CTTGTGCTGT TCCGGCCGCT CTTCTCTCT CCGCCCGCG CGCTCCCGC
CCGCTCGTG CCGTGGCCCG GCCTCTCTCT GCGCGTCTG TCGGGCGGCG GCCTTGGCG GCTTGTGGG GCTGCTCTG
GCGCTTCCG CCTCGGCTT GGGCGCTCT TCCGCTGT GCTGGTGGC CTCGTGGGC CCTCTGGC TCCGCTGTCC
TGTGGTCCC CGGCTGTGG CCGGGCCGCT TGGCGGGCG TGGCGGCCG CGGGTCTCC GGGCTGCCCT TCTCCCGCCG
20 GGGTCCCGC CTCTGCTGT TCCTGGGCT CTTCTGCTC TCTCTGGGT GGGTGTGGG TGGCGGGTC TCCGGGCTG TCCGGGCTG
CCCGCGCTG TCGGGCGTTC TGCGGTCTG TGGGTGCTG TGGCGCGCT CGTGTGCGC TCCGTGCGCC TCCGCGGCC
TCGTCCCTC CTGGGTGCG GCGGGGCTG TCCTGCGCT TGTCTCTC CTGGGCTCT TGGGTGCBG GCGCCBTCT
GCTGCGCTG GCGGCTGCT TCGTCCGTC TCGTGGGGC CCGGGGTGG TGGCGCTGC TTGCGGACG ACCCGGGCG
GACCGAGG TCGGGGGCT GTGTTCTGG CCGTGGGGC GCTGGTGGC TTGGGCCCT CTGGGGCTG GGTTCCTGC TCGGCTGGG
25 CGTGGCGTC TTGGGGTGC GGGCGGGGG GCGGGGGGG CGTGTCTGT GGGCTGGGG GTGCTGTGG CTGCGGCTG
CCCGGCTTG TGGCGCCGTC CTGCTGCCG TCGTGGCTG GGTCCCGCC CCGGTTTCT GGGGTCCCG TGGGTGCTC
CGGTTCTCT TGCGCTGCT GCCTTGTCT TCCGGCGCT GCGGCGTGT GGTCCCGCC CCTTGGCTT CTGCTCGGG
TCTGGCTGT TGCGGTGCC CTTGGCGGCG GTCTCTCT TGGTGGCTG GGGCGCGCT GGGCGCGCTT GGTCTCGCTT CTGCTCGGG
30 CGCTCTGTG CTGTTCCGG CGCTCTTCC TCTCCGCG CCGCGCTCC CCGCGCTC GTCGCGCTG CCGGCTCTC
TCTGGCGC TGTCTCGGC GCGGCGCTG GCGTCCGCT TGGGGCTGCC TCTGGCGCT CCGGCGCTG GCTGGGGC
TCTCTCCG CTGTCTGT GGCCTCTGT GCGGCTCT GCGCTCCGT GTCTGTGGT CCGCGGCTG GTGGCGGGC
CGGTTGGCG GCGGTGGCG CCGCGGCTC CTCCGGCTG CCTTCTCC CCGGGGTCC CGGCTCTG CTGTTCCCTG
GGCTCTCT CTTCTCTCT GGTGGGTGC TGGGTGCCG GGTCTCCGG CTGCCCCG GCTGCTGGC GTTCTCGGT
CTTGGGGT TGTGTGGCC CGCTCGTGC GCGCTCCGT CCGGCTGCC GCGCTCTG CCTCTGGT GCGGCGCGG
35 CTGGTCTGG CGTTTGTCT CTTCTGG-3' (FRAG. NO:1892) (SEQ ID NO:11274)
5'-GCGGGGCGG-3' (FRAG. NO:1893) (SEQ ID NO:11275)
5'-CGGGGGG-3' (FRAG. NO:1894) (SEQ ID NO:11276)
5'-GCGCGGCGGGC-3' (FRAG. NO:1895) (SEQ ID NO:11277)
5'-CTGTGCTCCGTCTGCTGG (FRAG. NO:1390)(SEQ ID NO:10768)
40 GGGGCGGGGTGGGTGGGCCCTGCTTGGCG (FRAG. NO:1391)(SEQ ID NO:10769)
ACGACCCCGGGGACCCGAG (FRAG. NO:1392)(SEQ ID NO:10770)
GCTCGGGGGCTGTGTTCTGGCGCTGGTGG (FRAG. NO:1393)(SEQ ID NO:10771)
CTTGGGCCCTCTGGGGCTGGGT (FRAG. NO:1394)(SEQ ID NO:10772)
TCTGTGCGCCTGGGCGCTG (FRAG. NO:1395)(SEQ ID NO:10773)
45 CGGCTTGGGGTGC (FRAG. NO:1396)(SEQ ID NO:10774)
GGGGCGGGGGCGGGGG (FRAG. NO:1397)(SEQ ID NO:10775)
GCCGCTGTCTGGGCGCTGG (FRAG. NO:1398)(SEQ ID NO:10776)
GGTGCCTGTGGCTGCC (FRAG. NO:1399)(SEQ ID NO:10777)
GGTTGCCCGGTTGGTGGC (FRAG. NO:1400)(SEQ ID NO:10778)
50 GCGCTCTGCTGCCGT (FRAG. NO:1401)(SEQ ID NO:10779)
CGTTGGCTGGGTCCCCCGC (FRAG. NO:1402)(SEQ ID NO:10780)
CGTTTCTTGGGGTCC (FRAG. NO:1403)(SEQ ID NO:10781)
GCGTGGGGTCTCC (FRAG. NO:1404)(SEQ ID NO:10782)
GGTCTCTCTGCTCC (FRAG. NO:1405)(SEQ ID NO:10783)
55 CTGCTGCTTGTCTTCC (FRAG. NO:1406)(SEQ ID NO:10784)
GGCGTGGCGCGGTGGTGGTCC (FRAG. NO:1407)(SEQ ID NO:10785)
GCCCCCTGGCTTCTGCTC (FRAG. NO:1408)(SEQ ID NO:10786)
GGGGTCTGGCTGGT (FRAG. NO:1409)(SEQ ID NO:10787)
TGCGGTGCCCTTGGCGG (FRAG. NO:1410)(SEQ ID NO:10788)
60 GGTCTTCTCTGGT (FRAG. NO:1411)(SEQ ID NO:10789)
GCTGTGGGCGCGGCTCTCG (FRAG. NO:1412)(SEQ ID NO:10790)
GCGTCTCTGTTCG (FRAG. NO:1413)(SEQ ID NO:10791)
CTCTGTGCTGTTCGCGCG (FRAG. NO:1414)(SEQ ID NO:10792)
CTCCTCTCTTCCCGGCC (FRAG. NO:1415)(SEQ ID NO:10793)
65 GCGCTCCCCGCC (FRAG. NO:1416)(SEQ ID NO:10794)
GCTGTCGCCCTGGCC (FRAG. NO:1417)(SEQ ID NO:10795)
GGCTCTCTCTGGCGC (FRAG. NO:1418)(SEQ ID NO:10796)
TGTCTCGGGCGGCGCTTGGC (FRAG. NO:1419)(SEQ ID NO:10797)
GCTCCGTTGGGGCTG (FRAG. NO:1420)(SEQ ID NO:10798)
70 CCTGTGGCGCTCC (FRAG. NO:1421)(SEQ ID NO:10799)
GGCCCTCGGCTGGCGCTC (FRAG. NO:1422)(SEQ ID NO:10800)
TCTTCCGCTGTGC (FRAG. NO:1423)(SEQ ID NO:10801)
TGTGGCCCTCTGG (FRAG. NO:1424)(SEQ ID NO:10802)
GCCCCCTGGCTCCGCTGTC (FRAG. NO:1425)(SEQ ID NO:10803)
75 TGTGGTCCCCGCTGTT (FRAG. NO:1426)(SEQ ID NO:10804)

- GGCCGGGGCCGGTTGGGCGGGC (FRAG. NO:1427)(SEQ ID NO:10805)
 GTGGGGCGCCGGGGTCTCC (FRAG. NO:1428)(SEQ ID NO:10806)
 GGGCTGCCCTTCTCC (FRAG. NO:1429)(SEQ ID NO:10807)
 GCCGGGGTCCCGC (FRAG. NO:1430)(SEQ ID NO:10808)
 5 GCTCCTGCTGTTCCCTGGGCTCTTCTGCC (FRAG. NO:1431)(SEQ ID NO:10809)
 TCTCTCTGGGTGGGTGCTGGGTGCCG (FRAG. NO:1432)(SEQ ID NO:10810)
 GGGTCTCCGGGCTTG (FRAG. NO:1433)(SEQ ID NO:10811)
 CCCCGCGCTGCTGGGCGTTCTGC (FRAG. NO:1434)(SEQ ID NO:10812)
 GGTCTTGGGGTTGTC (FRAG. NO:1435)(SEQ ID NO:10813)
 10 TGTGGCCCCGCTCG (FRAG. NO:1436)(SEQ ID NO:10814)
 TGTGCGCCCTCCGTCGCC (FRAG. NO:1437)(SEQ ID NO:10815)
 CGTCGCGCGCCTCGTCC (FRAG. NO:1438)(SEQ ID NO:10816)
 CCTCCTGGGTGCGC (FRAG. NO:1439)(SEQ ID NO:10817)
 GGC GGCTGGTTCCT (FRAG. NO:1440)(SEQ ID NO:10818)
 15 GGC GTTTTGTCTCTCTCTGG (FRAG. NO:1441)(SEQ ID NO:10819)
 5'-GCGTCTTGGGGTGCBBGGGCCBCTCCTGCTGCGCCTGGGCGCTG-3'(FRAG. NO:1896) (SEQ ID NO:11278)

Inducible Nitric Oxide Synthase Nucleic Acids and Antisense Oligonucleotide Fragments

- 5'-CTGCCCCBGT TTTTGTCTC CBCBTGCCGT GGGGBGGBCB BTGGCTGCCT CCCCGGGGT TCTGCTGCTT GCTGCTTCTT
 TCCCGTCTCC CTCTTTCCC GTCTCTTTT TGCTCTTTG GGTTCCTGTT GTTCTGGCC TGCTTGGTGG CGGCTTGTGC
 20 GTTCTCTCTC TCTTCTCTG GGTCTCCGT TCTCGTCTG CCTTTCTCTG TCTCTGTCG GCCGTTCCTC CTCCGGCGTC
 CTCTGCCCT GTGCTGTTG CCTCGGTGG TGCGGGTCC GGTGCTCCC CGGCGGGCCG GCTGGTGGCC TGGGCTGTG
 TGGTGGGGTG TGGGGCCGCT GGGTTGGGGG TGTGGTGGG TCTTCTGTG CCTGTGGGGC TGTGGTGTG TCTGTGGCG
 TGTGCTGGGT CTGGGGGCTT CCTCCCTGT GCTGGGTGCG GCCTCCCGC CCCCTTCTG GGCCGTGGC CTGGCTCTT
 GTGGGCGCTT CTGGCTCTT CCTGTCTT CTTCGCTCTG TGCTGCTGG GCTGC CATATGTATG GGAATACTGT
 25 ATTTACAGAA TTATAAGGAA TGAAATTATA GGCGGGTCACT TGTGGCTAAC CCTGTAAATC CTAGACTTTT GAGAGGCTGA
 AGTGGGCAGA TCACTTGAGC TTCAGAGTTC GAGACCAGCA TGGACAACAT GGTGAAACCC AGTCTCTACC AAAACACAA
 AAATATTAGC TGGGTGTGGT GGTGCATGCC TGTAGTCCCA GCTACTCAGG AGGCTGAGGT GGGAGGATCG CTGAGCGCTG
 GGAGGCAGAA GTTGCAATGA GCAGAGATCG TGCCACTCCG CTCCAGTCTT GGTGACAGAA TGAGACTCCA TCTCAAAAT
 AAATAAATAA ATAAATAAAA TAAATGAAAT GAAATTATAA GAAATTACCA CTTTTTCATG TAAGAAGTGA TCATTTCCAT
 30 TATAAGGGAA GGAATTTAAT CCTACCTGCC ATTCCACCAA AGCTTACCTA GTGCTAAAGG ATGAGGTGTT AGTAAGACCA
 ACATCTCAGA GGCCTCTCTG TGCCAATAGC CTTCCTTCTT TTCCCTTCCA AAAACCTCAA GTGACTAGTT CAGAGGCTG
 TCTGGAATAA TGGCATCATC TAATATCACT GGCTTCTGGA AACCTGGGCA TTTTCCAGTG TGTCCATAC TGTCAATATT
 CCCCCAGCTT CTGGACTCC TGTACAAGC TGGAAAAGTG AGAGGATGGA CAGGGATTAA CCAGAGAGCT CCCTGCTGAG
 GAAAAAATCT CCCAGATGCT GAAAGTGAGG CCATGTGGCT TGGCCAAATA AAACCTGCT CCCTGGTGCC TCTGTCTTAG
 35 CAGCCACCCT GCTGATGAAC TGCCACCTTG GACTTGGGAC CAGAAAAGTG TGGGTGGGT GAAGAGGCAC CACACAGAGT
 GATGTAACAG CAAGATCAGG TCACCCACAG GCCCTGGCAG TCACAGTCAT AAATTAGCTA ACTGTACACA AGCTGGGGAC
 ACTCCCTTTG GAAACCAAAA AAAAAAAGAGA CCTTTATGCA AAAACAACCTC TCTGGATGGC ATGGGGTGAG
 TATAAATACT TCTTGGCTGC CAGTGTGTTT ATAACCTTGT AGCGAGTGA AAACCTGAGG TCCGGCCGCA GAGAACTCAG
 CCTCATCTCT GCTTTAAAT CTCTCGGCA CCTTTGATGA GGGGACTGGG CAGTCTAGA CAGTCCCGAA GTTCTCAAGG
 40 CACAGGTCTC TTCTGTTT GACTGTCTT ACCCGGGGA GGCAGTGCA CAGCTGCAA GGTGAGTTGC C CATATGTATG
 GGAATACTGT ATTTACAGCA TTATAAGGAA TGAAATTATA GGCGGGCAT TGTGGCTAAC CCTGTAAATC CTAGACTTTT
 GAGAGGCTGA AGTGGGCAGA TCACTTGAGC TTCAGAGTTC GAGACCAGCA TGGACAACAT GGTGAAACCC AGTCTCTACC
 AAAACACAA AAATATTAGC TGGGTGTGGT GGTGCATGCC TGTAGTCCCA GCTACTCAGG AGGCTGAGGT GGGAGGATCG
 CTGAGGCTG GGAGGCAGAA GTTGCAATGA GCAGAGATCG TGCCACTCCG CTCCAGTCTT GGTGACAGAA TGAGACTCCA
 45 TCTCAAAAT AAATAAATAA ATAAATAAAA TAAATGAAAT GAAATTATAA GAAATTACCA CTTTTTCATG TAAGAAGTGA
 TCAATTTCCAT TATAAGGAA GGAATTTAAT CTACCTGCC ATTCCACCAA AGCTTACCTA GTGCTAAAGG ATGAGGTGTT
 AGTAAGACCA ACATCTCAGA GGCCTCTCTG TGCCAATAGC CTTCCTTCTT TTCCCTTCCA AAAACCTCAA GTGACTAGTT
 CAGAGGCTG TCTGGAATAA TGGCATCATC TAATATCACT GGCTTCTGGA AACCTGGGCA TTTTCCAGTG TGTCCATAC
 TGTCAATATT CCCCCAGCTT CTGGACTCC TGTACAAGC TGGAAAAGTG AGAGGATGGA CAGGGATGGA CAGGAGAGCT
 50 CCCTGCTGAG GAAAAAATCT CCCAGATGCT GAAAGTGAGG CCATGTGGCT TGGCCAAATA AAACCTGGCT CCCTGGTGCC
 TCTGTCTTAG CAGCCACCCT GCTGATGAAC TGCCACCTTG GACTTGGGAC CAGAAAAGTG TGGGTGGGT GAAGAGGCAC
 CACACAGAGT GATGTAACAG CAAGATCAGG TCACCCACAG GCCCTGGCAG TCACAGTCAT AAATTAGCTA ACTGTACACA
 AGCTGGGGAC ACTCCCTTTG GAAACCAAAA AAAAAAAGAGA CCTTTATGCA AAAACAACCTC TCTGGATGGC
 ATGGGGTGAG TATAAATACT TCTTGGCTGC CAGTGTGTTT ATAACCTTGT AGCGAGTGA AAACCTGAGG TCCGGCCGCA
 55 GAGAACTCAG CCTCATCTCT GCTTTAAAT CTCTCGGCA CCTTTGATGA GGGGACTGGG CAGTCTAGA CAGTCCCGAA
 GTTCTCAAGG CACAGTCTC TTCTGTTT GACTGTCTT ACCCGGGGA GGCAGTGCA CAGCTGCAA GGTGAGTTGC C-3'
 (FRAG. NO:) (SEQ ID NO:12385)
 5'-CTGCTTTAAA ATCTCTCGGC CACCTTTGAT GAGGGGACTG GGCAGTTCTA GACAGTCCCG AAGTTCTCAA GGCACAGGTC
 TCTTCTGGT TTGACTGTCC TTACCCCGGG GAGGCAGTGC AGCCAGTGC AAGCCCCACA GTGAAGAACA TCTGAGCTCA
 60 AATCCAGATA AGTGACATAA GTGACCTGCT TTGTAAAGCC ATAGAGATGG CTGTCTCTG GAAATTTCTG TTCAAGACCA
 AATTCCACCA GTATGCAATG AATGGGGAAA AAGACATCAA CAACAATGTG GAGAAAGCCC CTGTGGCCAC CTCCAGTCCA
 GTGACACAGG ATGACCTTCA GTATCACAAC CTCAGCAAGC AGGACAATGA GTCCCCGAG CCCCTCGTGG AGACGGGAAA
 GAAAGTCTCA GAATCTCTG TCAAGCTGGA TGCAACCCCA TTGTCTCC CACGGCATGT GAGGATCAA AACTGGGGCA
 GCGGGATGAC TTCCAAGAC ACACCTTACC ATAAGGCCAA AGGGATTTTA ACTTGCAGGT CCAATCTTG CCTGGGGTCC
 65 ATTATGACTC CAAAAGTTT GACCAGAGGA CCCAGGGACA AGCCTACCCC TCCAGATGAG CTCTACCTC AAGCTATCGA
 ATTTGTCAAC CAATATTACG GCTCCTTCAA AGAGGCAAAA ATAGAGGAAC ATCTGGCCAG GGTGGAAGCG GTAACAAAGG
 AGATAGAAAC AACAGGAACC TACCACTGA CGGGAGATGA GCTCATCTT GCCACCAAGC AGGCTTGGCG AATGCTGCGA
 CGCTGCATTG GGAGGATCCA GTGGTCCAAC CTGCAGGTCT TCGATGCCCC CAGCTGTTCC ACTGCCCCGG AAATGTTTGA
 ACACATCTCG AGACACGTGC GTTACTCCA CAACAATGGC AACATCAGGT CGGCCATCAC CGTGTCTCCC CAGCGGAGTG
 70 ATGGCAAGCA CGACTTCCG GTGTGGAATG CTACAGTCAT CCGCTATGCT GGCTACCAGA TGCCAGATGG CAGCATCAGA
 GGGGACCCTG CCAACGTGGA ATTCACTCAG CTGTGCATCG ACCTGGGCTG GAAGCCCAAG TACGGCCGCT TCGATGTGGT
 CCCCCTGTG CTGACGGCA ATGGCCGTGA CCCTGAGCTC TTGAAAATCC CACCTGACCT TGTGCTTGA GTGGCCATGG
 AACATCCCAA ATACAGAGTG TTTCCGGGAA CCGGAGCTAA GTGGTACGCC CTGCTGACG TGGCAACAT GCTGCTTGA
 GTGGGCGGCC TGGAGTTCCC AGGGTCCCC TTCAATGGCT GTGATACGG CACAGAGATC CAGTCCCGG ACTCTGTGA
 75 CGTCCAGCGC TACAACATCC TGGAGGAAGT GGCAGGAGA ATGGCCCTG AAACGCACAA GCTGGCTCG CTCTGGAAG

	ACCAGGCTGT	CGTTGAGATC	AACATTGCTG	TGATCCATAG	TTTTCAGAAG	CAGAATGTGA	CCATCATGGA	CCACCACTCG
	GCTGCAGAA	CTTTCATGAA	GTACATGCAG	AATGAATACC	GGTCCCGTGG	GGGCTGCCCG	GCAGACTGGA	TTTGCTGGT
	CCCTCCCATG	TCTGGGAGCA	TCACCCCGCT	GTTTCACACG	GAGATGCTGA	ACTACGTCTC	GTCCCGTTTC	TACTACTATC
	AGGTAGAGGC	CTGGAAGAAC	CATGTCTGGC	AGGACGAGAA	GCGGAGACCC	AAGAGAAGAG	AGATTCCATT	GAAAGTCTTG
5	GTCAAAGCTG	TGCTCTTTGC	CTGTATGCTG	ATGCGCAAGA	CAATGGCGTC	CCGAGTCAGA	GTCAACCATC	TCTTTGCGAC
	AGAGACAGGA	AAATCAGAGG	CGCTGGCCTG	GGACCTGGGG	GCCTTATTCA	GCTGTGCCTT	CAACCCCAAG	GTTGTCTGCA
	TGGATAAGTA	CAGGCTGAGC	TGCCTGGAGG	AGGAACGGCT	GCTGTGGTGT	GTGACCACTA	CGTTTGGCAA	TGGAGACTGC
	CCTGGCAATG	GAGAGAAACT	GAAGAAATCG	CTCTTCATGC	TGAAAGAGCT	CAACAACAAA	TTCAGGTACG	CTGTGTTTGG
	CCTCGGCTCC	AGCATGTACC	CTCGGTTCTG	CGCCTTTGCT	CATGACATTG	ATCAGAAGCT	GTCCCACTTG	GGGGCCTCTC
10	AGTCAACCCG	GATGGGAGAA	GGGGATGAGC	TCAGTGGGCA	GGAGGACGCC	TTCCGCAGCT	GGGCGGTGCA	AACCTTCAAG
	GCAGCCTGTG	AGACGTTTGA	TGTCCGAGGC	AAACAGCACA	TTCAGATCCC	CAAGCTCTAC	ACCTCCAATG	TGACCTGGGA
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AGTTCGGGA GAGCGGCTG CCGACTGAG TCCGCGGAC CAGGATCAG CCGCTCTC CCGCTTGTG GTGGTGCCTT
CTCACATCTG TCCAGAGGCT GCAAGGATTC AGCATTATTC CTCAGGAAG GAGCAAAACG CCTCTTTTCC CTCTTAGGC
CTGTTGCTC GGGCCTGGT CCGCTTAAT CTGGAAGGCC CCTCCAGCA GCGGTACCC AGGGCTACT GCCACCGCT
55 TCTGTTTCT TAGTCCGAAT GTTAGATTCC TCTTGCCTCT CTCAGGAGTA TCTTACCTGT AAAGTCTAAT CTCTAAATCA
AGTATTTATT ATTGAAGATT TACCATAAG GACTGTGCCA GATGTTAGGA GAACACTAA AGTGCTACC CCAGCTC-3' (FRAG.
NO:)(SEQ ID NO:11877)
5'-CCCCGGGG-3' (FRAG. NO:1898) (SEQ ID NO:11280)
5'-GGGGCCGCTGGG-3' (FRAG. NO:1899) (SEQ ID NO:11281)
60 5'-GGGGGTGTGG-3' (FRAG. NO:1900) (SEQ ID NO:11282)
5'-CTGCTCCCGGGGT-3' (FRAG. NO:1442) (SEQ ID NO:10820)
5'-TTCTGCTGCTTGGT-3' (FRAG. NO:1443) (SEQ ID NO:10821)
5'-CTTCTTTCCCGTCTCC-3' (FRAG. NO:1444) (SEQ ID NO:10822)
5'-CTTCTTTCCCGTCTCC-3' (FRAG. NO:1445) (SEQ ID NO:10823)
65 5'-TTTTTGCTCTTTG-3' (FRAG. NO:1446) (SEQ ID NO:10824)
5'-GGTTCCTGTTGTTTCT-3' (FRAG. NO:1447) (SEQ ID NO:10825)
5'-GGCTGCTTGGTGGCG-3' (FRAG. NO:1448) (SEQ ID NO:10826)
5'-GCTTGTGCTTTCC-3' (FRAG. NO:1449) (SEQ ID NO:10827)
5'-TCTCTCTCTCTTGGGTCTCCGCTTCTGCTCTGCC-3' (FRAG. NO:1450) (SEQ ID NO:10828)
70 5'-TTTTCCTGCTCTGCTGCC-3' (FRAG. NO:1451) (SEQ ID NO:10829)
5'-GCCGTTCTCTCTCC-3' (FRAG. NO:1452) (SEQ ID NO:10830)
5'-GGGCTCCTCTGCC-3' (FRAG. NO:1453) (SEQ ID NO:10831)
5'-TGTGCTGTTGCTCGG-3' (FRAG. NO:1454) (SEQ ID NO:10832)
5'-GTGGTGGGGTCCC-3' (FRAG. NO:1455) (SEQ ID NO:10833)
75 5'-GGTGTCTCCCGGCG-3' (FRAG. NO:1456) (SEQ ID NO:10834)

- 5'-GGGCCGGCTGGTTGCCTGGGC-3' (FRAG. NO:1457)(SEQ ID NO:10835)
 5'-CTGTCTGGTGGGGTGTGGGGCC-3' (FRAG. NO:1458)(SEQ ID NO:10836)
 5'-GCTGGGTGGGGGTGGTG-3' (FRAG. NO:1459)(SEQ ID NO:10837)
 5'-GGCTCTTCTGTGGCC-3' (FRAG. NO:1460)(SEQ ID NO:10838)
 5'-TGTTGGGCTGTGGTG-3' (FRAG. NO:1461)(SEQ ID NO:10839)
 5'-TCTCTGTGGGCGTGTG-3' (FRAG. NO:1462)(SEQ ID NO:10840)
 5'-CTGGGTCTTGGGGCTTC-3' (FRAG. NO:1463)(SEQ ID NO:10841)
 5'-CTCCCTTGTGCTGGG-3' (FRAG. NO:1464)(SEQ ID NO:10842)
 5'-TGCGGCTCCCCGC-3' (FRAG. NO:1465)(SEQ ID NO:10843)
 5'-CCCCCTTCTGGGCC-3' (FRAG. NO:1466)(SEQ ID NO:10844)
 5'-GGTGGCTGGCTCCTTGTGG-3' (FRAG. NO:1467)(SEQ ID NO:10845)
 5'-GCGCTTCTGGCTCTTG-3' (FRAG. NO:1468)(SEQ ID NO:10846)
 5'-CCCTGTCTTCTTCGCCCTCGT-3' (FRAG. NO:1469)(SEQ ID NO:10847)
 5'-GGCTGCTGGGCTGC-3' (FRAG. NO:1470)(SEQ ID NO:10848)
 5'-CTGCCCCBGTTTTGTBCTCBCBTGCCGTGGGGBGBBTTGG-3' (FRAG. NO:1901) (SEQ ID NO:11283)
- NF-κB Nucleic Acids and Antisense Oligonucleotide Fragments**
 5'-CGGCCCTTCT CACTGGAGGC ACCGGGCAGT CCTCCATGGG AGGGTTGGGC TTGGCCGGGG CTGCCCCGTG CCTCCTCTTG
 GCTGGTCCCT GGTGTCCCTT GGGCCCCGC TCCCGCTGCT CGGCCTCCGT GTTCTTTGGC CTCCTGCTCC GCGTGTGTC
 TTGTCCCGTC CCTCCTCGC TTGCGTTTCC CTCTTCCTTG TCTTCCAGGC CTCCTCCGC TTCGCTGCT GGGGCCCGCG
 CCGGGGGGGC GCTCGGCTCC GCGGCTTCTT CCCCCTGCTGG GGGGTCTGCTG TCTCCGGGGC CTGCGGCTCG CGGGCTCGGG
 GCTGCGTGGC CCGCGCGCGG CGTCCGCGGT GGGTGGCGCT GTCCCGCGT GGTGTGTCTC CGTTCCTGTC CTGCGCGTCT
 CTGCTCTGCC CGTGGGGTCC TGGGCGTGGT GGGGGGCGTC TGGTGCCTCG TCTGCCCGGT GGGGCTTCGG GCTCGGGCT
 GTTCGTCCCC CCGCGGCTC TGTGGCCTCC GGGGCTCTC GTTTTCGCTG CTTCGGGTGT CCTTCTCGGC GTGTGCCCC
 GGGTCCCGGC CCGTCTGGGC TGGGCGGGGT CCGTGCCTG GCGTCTGTC CCGTCTGGT GTCTGTGCGT GCTGTCTCG
 GGTTCCTGTC CTCTGTGCTG GCGCTTCTC TGCTCTCTG TCCGCCCTCC TGGTGGCTCG GCTGGGGGTG CCGTGCGGG
 GGTGGGTGTG GGGTGTTCCT GGGGTCCTCC CCTTCCC-3' (FRAG. NO:1902) (SEQ ID NO:11284)
 5'-GGGCGGGGTGCGC-3' (FRAG. NO:1903) (SEQ ID NO:11285)
 5'-GCGCGTCC-3' (FRAG. NO:1904) (SEQ ID NO:11286)
 5'-GGGCGTGGTGG-3' (FRAG. NO:1905) (SEQ ID NO:11287)
 5'-GTTGGGCTTGGCCGGGG-3' (FRAG. NO:1471)(SEQ ID NO:10849)
 5'-CTGCCCGGTGCCTCC-3' (FRAG. NO:1472)(SEQ ID NO:10850)
 5'-TCTTGGCTGGTCCCTCGT-3' (FRAG. NO:1473)(SEQ ID NO:10851)
 5'-TGTCTTGGGCCCC-3' (FRAG. NO:1474)(SEQ ID NO:10852)
 5'-GCTCCCGCTGCTCGGCTCCGT-3' (FRAG. NO:1475)(SEQ ID NO:10853)
 5'-GTTCTTTGGCCTTGTGCTCC-3' (FRAG. NO:1476)(SEQ ID NO:10854)
 5'-GCGCTGTCTTGTGCTCC-3' (FRAG. NO:1477)(SEQ ID NO:10855)
 5'-CGTCCCTCTCGCTTGCCTTC-3' (FRAG. NO:1478)(SEQ ID NO:10856)
 5'-CCTCTTCTTGTCTTCCA-3' (FRAG. NO:1479)(SEQ ID NO:10857)
 5'-GGCCTTCTCCGCTTCCGCTGC-3' (FRAG. NO:1480)(SEQ ID NO:10858)
 5'-TGGGGCCCGCGCCGG-3' (FRAG. NO:1481)(SEQ ID NO:10859)
 5'-GGGGGGGCTCGGCTCCCGGCTTCTCCCGG-3' (FRAG. NO:1482)(SEQ ID NO:10860)
 5'-CTGGGGGCTCTGG-3' (FRAG. NO:1483)(SEQ ID NO:10861)
 5'-TCTCCGGGGCTGCGGCTCGC-3' (FRAG. NO:1484)(SEQ ID NO:10862)
 5'-GGGCTCGGGGCTGCGTGCGCC-3' (FRAG. NO:1485)(SEQ ID NO:10863)
 5'-GCGCGCGGCTCCGCGGTG-3' (FRAG. NO:1486)(SEQ ID NO:10864)
 5'-GGTGGCGCTGTCCCGCC-3' (FRAG. NO:1487)(SEQ ID NO:10865)
 5'-GTGGTGTGCTCCGTTCTCGTCTGCGCGTCTC-3' (FRAG. NO:1488)(SEQ ID NO:10866)
 5'-CTGGTCTGCGCGTGG-3' (FRAG. NO:1489)(SEQ ID NO:10867)
 5'-GGTCTGGGCGTGGTGG-3' (FRAG. NO:1490)(SEQ ID NO:10868)
 5'-GGGGGCTGTGGTGC-3' (FRAG. NO:1491)(SEQ ID NO:10869)
 5'-CTCGTCTGCCCCGTG-3' (FRAG. NO:1492)(SEQ ID NO:10870)
 5'-GGGCTTCGGGCTCGG-3' (FRAG. NO:1493)(SEQ ID NO:10871)
 5'-GGCTGTCTGTCCTCCGCTGCGCTCTGTGGCTCC-3' (FRAG. NO:1494)(SEQ ID NO:10872)
 5'-GGGGCTCTCGTTTC-3' (FRAG. NO:1495)(SEQ ID NO:10873)
 5'-GCTGCTCGGGTGTCTTCTC-3' (FRAG. NO:1496)(SEQ ID NO:10874)
 5'-GGCGTGTGGCCCCGG-3' (FRAG. NO:1497)(SEQ ID NO:10875)
 5'-GTCCCGGCGCTGTGGGCTGGGCGGGGTC-3' (FRAG. NO:1498)(SEQ ID NO:10876)
 5'-GCTGCCCTGGGCTTCTGGCCCGTCT-3' (FRAG. NO:1499)(SEQ ID NO:10877)
 5'-GGTTGTCTGCGGT-3' (FRAG. NO:1500)(SEQ ID NO:10878)
 5'-GCTTGTCTCGGGTTTCTGG-3' (FRAG. NO:1501)(SEQ ID NO:10879)
 5'-CCTCTGTGCTGGGC-3' (FRAG. NO:1502)(SEQ ID NO:10880)
 5'-GCTTCTGCTCCTGCTCC-3' (FRAG. NO:1503)(SEQ ID NO:10881)
 5'-GCCCCCTGGTGGCTC-3' (FRAG. NO:1504)(SEQ ID NO:10882)
 5'-GGTGGGGGTGCCCGTGGC-3' (FRAG. NO:1505)(SEQ ID NO:10883)
 5'-GGGGTGGGTGTGGGTGTT-3' (FRAG. NO:1506)(SEQ ID NO:10884)
 5'-TTCGGGGTCTCCCTTCCC-3' (FRAG. NO:1507)(SEQ ID NO:10885)
 5'-CGGCCCTTCTCACTGGAGGACCGGCGAGTCCCTCCATGGAGG-3' (FRAG. NO:1906)(SEQ ID NO:11288)
- Human Major Basic Protein Nucleic Acids and Antisense Oligonucleotide Fragments**
 5'-GTT TCA TCT TGG CTT TAT CCTCT CCC CTT GTT CCT CCC CTCT CCT GCT CTG GRG TCT CCT C TTC CCT CCC TCC CCT GCC
 GTG TTG TCT GTG GGT GTC GTT TCG CTC TTG TTG CCC TGG GCC CTT CCC TGC TGG GGG GGA GTT TCA TCT TGG GTT TCB
 TCT TGG CTT TBT CCTCT CCC CTT GTT CCT CCC CTCT CCT GCT CTG GRG TCT CCT C TTC CCT CCC TCC CCT GCC GTG TTG
 TCT GTG GGT GTC GTT TCG CTC TTG TTG CCC TGG GCC CTT CCC TGC TGG GGG GGB GTT TCB TCT TGG-3' (FRAG. ID:1907)
 (SEQ ID NO:11289)
 5'-GGG GGA GTT-3' (FRAG. ID:1908) (SEQ ID NO:11290)

- 5'-G CCC TGG GCC C-3' (FRAG. ID:1909) (SEQ ID NO:11291)
 5'-GTT TCA TCT TGG CTT TAT CC-3' (FRAG. NO:1508) (SEQ ID NO:10886)
 5'-TCT CCC CTT GTT CCT CCC C-3' (FRAG. NO:1509) (SEQ ID NO:10887)
 5'-TCT CCT GCT CTG GRG TCT CCT C-3' (FRAG. NO:1510) (SEQ ID NO:10888)
 5 5'-TTC CCT CCC TCC CCT GCC-3' (FRAG. NO:1511) (SEQ ID NO:10889)
 5'-GTG TIG TCT GTG GGT GTC C-3' (FRAG. NO:1512) (SEQ ID NO:10890)
 5'-GTT TCG CTC TTG TTG CCC-3' (FRAG. NO:1513) (SEQ ID NO:10891)
 5'-TGG GCC CTT CCC TGC TGG-3' (FRAG. NO:1514) (SEQ ID NO:10892)
 5'-GGG GGA GTT TCA TCT TGG-3' (FRAG. NO:1515) (SEQ ID NO:10893)
 10 5'-GTT TCA TCT TGG CTT TAT CCTCT CCC CTT GTT CCT CCC CTCT CCT GCT CTG GRG TCT CCT C TTC CCT CCC TCC CCT GCC
 GTG TTG TCT GTG GGT GTC GTT TCG CTC TTG TTG CCC TGG GCC CTT CCC TGC TGG GGG GGA GTT TCA TCT TGG-3' (FRAG.
 ID:1910) (SEQ ID NO:11292)
 5'-GTT TCB TCT TGG CTT TBT CCTCT CCC CTT GTT CCT CCC CTCT CCT GCT CTG GRG TCT CCT C TTC CCT CCC TCC CCT GCC
 GTG TTG TCT GTG GGT GTC GTT TCG CTC TTG TTG CCC TGG GCC CTT CCC TGC TGG GGG GGB GTT TCB TCT TGG-3' (FRAG.
 ID:1911) (SEQ ID NO:11293)
Human Eosinophil Major Basic Protein Nucleic Acids and Antisense Oligonucleotide Fragments
 5'-GGG GGB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1516) (SEQ ID NO:10894)
 5'-GGG GGB GTT TCB TCT TGG CTT-3' (FRAG. NO:1517) (SEQ ID NO:10895)
 5'-GGG GGB GTT TCB TCT TGG CT-3' (FRAG. NO:1518) (SEQ ID NO:10896)
 20 5'-GGG GGB GTT TCB TCT TGG C-3' (FRAG. NO:1519) (SEQ ID NO:10897)
 5'-GGG GGB GTT TCB TCT TGG-3' (FRAG. NO:1520) (SEQ ID NO:10898)
 5'-GGG GGB GTT TCB TCT TG-3' (FRAG. NO:1521) (SEQ ID NO:10899)
 5'-GGG GGB GTT TCB TCT T-3' (FRAG. NO:1522) (SEQ ID NO:10900)
 5'-GGG GGB GTT TCB TCT-3' (FRAG. NO:1523) (SEQ ID NO:10901)
 25 5'-GGG GGB GTT TCB TC-3' (FRAG. NO:1524) (SEQ ID NO:10902)
 5'-GGG GGB GTT TCB T-3' (FRAG. NO:1525) (SEQ ID NO:10903)
 5'-GGG GGB GTT TCB-3' (FRAG. NO:1526) (SEQ ID NO:10904)
 5'-GG GGB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1527) (SEQ ID NO:10905)
 5'-GG GGB GTT TCB TCT TGG CTT-3' (FRAG. NO:1528) (SEQ ID NO:10906)
 30 5'-GG GGB GTT TCB TCT TGG CT-3' (FRAG. NO:1529) (SEQ ID NO:10907)
 5'-GG GGB GTT TCB TCT TGG C-3' (FRAG. NO:1530) (SEQ ID NO:10908)
 5'-GG GGB GTT TCB TCT TGG-3' (FRAG. NO:1531) (SEQ ID NO:10909)
 5'-GG GGB GTT TCB TCT TG-3' (FRAG. NO:1532) (SEQ ID NO:10910)
 5'-GG GGB GTT TCB TCT T-3' (FRAG. NO:1533) (SEQ ID NO:10911)
 35 5'-GG GGB GTT TCB TCT-3' (FRAG. NO:1534) (SEQ ID NO:10912)
 5'-GG GGB GTT TCB TC-3' (FRAG. NO:1535) (SEQ ID NO:10913)
 5'-GG GGB GTT TCB T-3' (FRAG. NO:1536) (SEQ ID NO:10914)
 5'-G GGB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1537) (SEQ ID NO:10915)
 5'-G GGB GTT TCB TCT TGG CTT-3' (FRAG. NO:1538) (SEQ ID NO:10916)
 40 5'-G GGB GTT TCB TCT TGG CT-3' (FRAG. NO:1539) (SEQ ID NO:10917)
 5'-G GGB GTT TCB TCT TGG C-3' (FRAG. NO:1540) (SEQ ID NO:10918)
 5'-G GGB GTT TCB TCT TGG-3' (FRAG. NO:1541) (SEQ ID NO:10919)
 5'-G GGB GTT TCB TCT TG-3' (FRAG. NO:1542) (SEQ ID NO:10920)
 5'-G GGB GTT TCB TCT T-3' (FRAG. NO:1543) (SEQ ID NO:10921)
 45 5'-G GGB GTT TCB TCT-3' (FRAG. NO:1544) (SEQ ID NO:10922)
 5'-G GGB GTT TCB TC-3' (FRAG. NO:1545) (SEQ ID NO:10923)
 5'-GGB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1546) (SEQ ID NO:10924)
 5'-GGB GTT TCB TCT TGG CTT-3' (FRAG. NO:1547) (SEQ ID NO:10925)
 5'-GGB GTT TCB TCT TGG CT-3' (FRAG. NO:1548) (SEQ ID NO:10926)
 50 5'-GGB GTT TCB TCT TGG C-3' (FRAG. NO:1549) (SEQ ID NO:10927)
 5'-GGB GTT TCB TCT TGG-3' (FRAG. NO:1550) (SEQ ID NO:10928)
 5'-GGB GTT TCB TCT TG-3' (FRAG. NO:1551) (SEQ ID NO:10929)
 5'-GGB GTT TCB TCT T-3' (FRAG. NO:1552) (SEQ ID NO:10930)
 5'-GGB GTT TCB TCT-3' (FRAG. NO:1553) (SEQ ID NO:10931)
 55 5'-GB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1554) (SEQ ID NO:10932)
 5'-GB GTT TCB TCT TGG CTT-3' (FRAG. NO:1555) (SEQ ID NO:10933)
 5'-GB GTT TCB TCT TGG CT-3' (FRAG. NO:1556) (SEQ ID NO:10934)
 5'-GB GTT TCB TCT TGG C-3' (FRAG. NO:1557) (SEQ ID NO:10935)
 5'-GB GTT TCB TCT TGG-3' (FRAG. NO:1558) (SEQ ID NO:10936)
 60 5'-GB GTT TCB TCT TG-3' (FRAG. NO:1559) (SEQ ID NO:10937)
 5'-GB GTT TCB TCT T-3' (FRAG. NO:1560) (SEQ ID NO:10938)
 5'-B GTT TCB TCT TGG CTT T-3' (FRAG. NO:1561) (SEQ ID NO:10939)
 5'-B GTT TCB TCT TGG CTT-3' (FRAG. NO:1562) (SEQ ID NO:10940)
 5'-B GTT TCB TCT TGG CTT-3' (FRAG. NO:1563) (SEQ ID NO:10941)
 65 5'-B GTT TCB TCT TGG CT-3' (FRAG. NO:1564) (SEQ ID NO:10942)
 5'-B GTT TCB TCT TGG C-3' (FRAG. NO:1565) (SEQ ID NO:10943)
 5'-B GTT TCB TCT TGG-3' (FRAG. NO:1565) (SEQ ID NO:10944)
 5'-B GTT TCB TCT TG-3' (FRAG. NO:1567) (SEQ ID NO:10945)
 5'-GTT TCB TCT TGG CTT T-3' (FRAG. NO:1568) (SEQ ID NO:10946)
 70 5'-GTT TCB TCT TGG CTT-3' (FRAG. NO:1569) (SEQ ID NO:10947)
 5'-GTT TCB TCT TGG CT-3' (FRAG. NO:1570) (SEQ ID NO:10948)
 5'-GTT TCB TCT TGG C-3' (FRAG. NO:1571) (SEQ ID NO:10949)
 5'-GTT TCB TCT TGG-3' (FRAG. NO:1572) (SEQ ID NO:10950)
 5'-TT TCB TCT TGG CTT T-3' (FRAG. NO:1573) (SEQ ID NO:10951)
 75 5'-TT TCB TCT TGG CTT-3' (FRAG. NO:1574) (SEQ ID NO:10952)

- 5'-TT TCB TCT TGG CT-3' (FRAG. NO:1575)(SEQ ID NO:10953)
 5'-TT TCB TCT TGG C-3' (FRAG. NO:1576)(SEQ ID NO:10954)
 5'-T TCB TCT TGG CTT T-3' (FRAG. NO:1577)(SEQ ID NO:10955)
 5'-T TCB TCT TGG CTT-3' (FRAG. NO:1578)(SEQ ID NO:10956)
 5 5'-T TCB TCT TGG CT-3' (FRAG. NO:1579)(SEQ ID NO:10957)
 5'-TCB TCT TGG CTT T-3' (FRAG. NO:1580)(SEQ ID NO:10958)
 5'-TCB TCT TGG CTT-3' (FRAG. NO:1581)(SEQ ID NO:10959)
 5'-GGG GGB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1582)(SEQ ID NO:10960)
 5'-GG GGB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1583)(SEQ ID NO:10961)
 10 5'-G GGB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1584)(SEQ ID NO:10962)
 5'-GGB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1585)(SEQ ID NO:10963)
 5'-GB GTT TCB TCT TGG CTT T-3' (FRAG. NO:1586)(SEQ ID NO:10964)
 5'-B GTT TCB TCT TGG CTT T-3' (FRAG. NO:1587)(SEQ ID NO:10965)
 5'-GTT TCB TCT TGG CTT T-3' (FRAG. NO:1588)(SEQ ID NO:10966)
 15 5'-TT TCB TCT TGG CTT T-3' (FRAG. NO:1589)(SEQ ID NO:10967)
 5'-T TCB TCT TGG CTT T-3' (FRAG. NO:1590)(SEQ ID NO:10968)
 5'-TCB TCT TGG CTT T-3' (FRAG. NO:1591)(SEQ ID NO:10969)
 5'-CB TCT TGG CTT T-3' (FRAG. NO:1592)(SEQ ID NO:10970)
 5'-GGG GGB GTT TCB TCT TGG CTT-3' (FRAG. NO:1593)(SEQ ID NO:10971)
 20 5'-GG GGB GTT TCB TCT TGG CTT-3' (FRAG. NO:1594)(SEQ ID NO:10972)
 5'-G GGB GTT TCB TCT TGG CTT-3' (FRAG. NO:1595)(SEQ ID NO:10973)
 5'-GGB GTT TCB TCT TGG CTT-3' (FRAG. NO:1596)(SEQ ID NO:10974)
 5'-GB GTT TCB TCT TGG CTT-3' (FRAG. NO:1597)(SEQ ID NO:10975)
 5'-B GTT TCB TCT TGG CTT-3' (FRAG. NO:1598)(SEQ ID NO:10976)
 25 5'-GTT TCB TCT TGG CTT-3' (FRAG. NO:1599)(SEQ ID NO:10977)
 5'-TT TCB TCT TGG CTT-3' (FRAG. NO:1600)(SEQ ID NO:10978)
 5'-T TCB TCT TGG CTT-3' (FRAG. NO:1601)(SEQ ID NO:10979)
 5'-TCB TCT TGG CTT-3' (FRAG. NO:1602)(SEQ ID NO:10980)
 5'-GGG GGB GTT TCB TCT TGG CT-3' (FRAG. NO:1603)(SEQ ID NO:10981)
 30 5'-GG GGB GTT TCB TCT TGG CT-3' (FRAG. NO:1604)(SEQ ID NO:10982)
 5'-G GGB GTT TCB TCT TGG CT-3' (FRAG. NO:1605)(SEQ ID NO:10983)
 5'-GGB GTT TCB TCT TGG CT-3' (FRAG. NO:1606)(SEQ ID NO:10984)
 5'-GB GTT TCB TCT TGG CT-3' (FRAG. NO:1607)(SEQ ID NO:10985)
 5'-B GTT TCB TCT TGG CT-3' (FRAG. NO:1608)(SEQ ID NO:10986)
 35 5'-GTT TCB TCT TGG CT-3' (FRAG. NO:1609)(SEQ ID NO:10987)
 5'-TT TCB TCT TGG CT-3' (FRAG. NO:1610)(SEQ ID NO:10988)
 5'-T TCB TCT TGG CT-3' (FRAG. NO:1611)(SEQ ID NO:10989)
 5'-GGG GGB GTT TCB TCT TGG C-3' (FRAG. NO:1612)(SEQ ID NO:10990)
 5'-GG GGB GTT TCB TCT TGG C-3' (FRAG. NO:1613)(SEQ ID NO:10991)
 40 5'-G GGB GTT TCB TCT TGG C-3' (FRAG. NO:1614)(SEQ ID NO:10992)
 5'-GGB GTT TCB TCT TGG C-3' (FRAG. NO:1615)(SEQ ID NO:10993)
 5'-GB GTT TCB TCT TGG C-3' (FRAG. NO:1616)(SEQ ID NO:10994)
 5'-B GTT TCB TCT TGG C-3' (FRAG. NO:1617)(SEQ ID NO:10995)
 5'-GTT TCB TCT TGG C-3' (FRAG. NO:1618)(SEQ ID NO:10996)
 45 5'-TT TCB TCT TGG C-3' (FRAG. NO:1619)(SEQ ID NO:10997)
 5'-GGG GGB GTT TCB TCT TGG-3' (FRAG. NO:1620)(SEQ ID NO:10998)
 5'-GG GGB GTT TCB TCT TGG-3' (FRAG. NO:1621)(SEQ ID NO:10999)
 5'-G GGB GTT TCB TCT TGG-3' (FRAG. NO:1622)(SEQ ID NO:11000)
 5'-GGB GTT TCB TCT TGG-3' (FRAG. NO:1623)(SEQ ID NO:11001)
 50 5'-GB GTT TCB TCT TGG-3' (FRAG. NO:1624)(SEQ ID NO:11002)
 5'-B GTT TCB TCT TGG-3' (FRAG. NO:1625)(SEQ ID NO:11003)
 5'-GTT TCB TCT TGG-3' (FRAG. NO:1626)(SEQ ID NO:11004)
 5'-GGG GGB GTT TCB TCT TG-3' (FRAG. NO:1627)(SEQ ID NO:11005)
 5'-GG GGB GTT TCB TCT TG-3' (FRAG. NO:1628)(SEQ ID NO:11006)
 55 5'-G GGB GTT TCB TCT TG-3' (FRAG. NO:1629)(SEQ ID NO:11007)
 5'-GGB GTT TCB TCT TG-3' (FRAG. NO:1630)(SEQ ID NO:11008)
 5'-GB GTT TCB TCT TG-3' (FRAG. NO:1631)(SEQ ID NO:11009)
 5'-B GTT TCB TCT TG-3' (FRAG. NO:1632)(SEQ ID NO:11010)
 5'-GGG GGB GTT TCB TCT T-3' (FRAG. NO:1633)(SEQ ID NO:11011)
 60 5'-GG GGB GTT TCB TCT T-3' (FRAG. NO:1634)(SEQ ID NO:11012)
 5'-G GGB GTT TCB TCT T-3' (FRAG. NO:1635)(SEQ ID NO:11013)
 5'-GGB GTT TCB TCT T-3' (FRAG. NO:1636)(SEQ ID NO:11014)
 5'-GB GTT TCB TCT T-3' (FRAG. NO:1637)(SEQ ID NO:11015)
 5'-B GTT TCB TCT T-3' (FRAG. NO:1638)(SEQ ID NO:11016)
 65 5'-GGG GGB GTT TCB TCT-3' (FRAG. NO:1639)(SEQ ID NO:11017)
 5'-GG GGB GTT TCB TCT-3' (FRAG. NO:1640)(SEQ ID NO:11018)
 5'-G GGB GTT TCB TCT-3' (FRAG. NO:1641)(SEQ ID NO:11019)
 5'-GGB GTT TCB TCT-3' (FRAG. NO:1642)(SEQ ID NO:11020)
 5'-GGG GGB GTT TCB TC-3' (FRAG. NO:1643)(SEQ ID NO:11021)
 70 5'-GG GGB GTT TCB TC-3' (FRAG. NO:1644)(SEQ ID NO:11022)
 5'-G GGB GTT TCB TC-3' (FRAG. NO:1645)(SEQ ID NO:11023)
 5'-GGG GGB GTT TCB T-3' (FRAG. NO:1646)(SEQ ID NO:11024)
 5'-GG GGB GTT TCB T-3' (FRAG. NO:1647)(SEQ ID NO:11025)
 5'-GGG GGB GTT TCB-3' (FRAG. NO:1648)(SEQ ID NO:11026)
 75 5'-TCT CCC CTT GTT CCT CCC C-3' (FRAG. NO:1649)(SEQ ID NO:11027)

- 5'-TCT CCT GCT CTG GTG TCT CCT C-3' (FRAG. NO:1650)(SEQ ID NO:11028)
 5'-TTC CCT CCC TCC CCT GCC-3' (FRAG. NO:1651)(SEQ ID NO:11029)
 5'-GTG TTG TCT GTG GGT GTC C-3' (FRAG. NO:1652)(SEQ ID NO:11030)
 5'-GTT TCG CTC TTG TTG CCC-3' (FRAG. NO:1653)(SEQ ID NO:10891)
 5'-TGG GCC CTT CCC TGC TGG-3' (FRAG. NO:1654)(SEQ ID NO:11032)
 5'-GGG GGB G-3' (FRAG. NO:1912)(SEQ ID NO:11294)
 5'-GTG GGT GTC C-3' (FRAG. NO:1913) (SEQ ID NO:11295)
- BP-1 Nucleic Acids and Antisense Oligonucleotide Fragments**
 5'-CCGCTGTGTC BGTGGTGCTG CCGCTTTGBG GTBTGGCGCT CCBCCBBTTC CCTTTTCTCC TTGTTTCCG TTCTCTTG
 5'-CGTCTGTGGT T-3' (FRAG. NO:1914) (SEQ ID NO:11296)
 5'-CCCGTTTGBGGTBTGGC-3' (FRAG. NO:1915) (SEQ ID NO:11297)
 5'-GCTCCBCCBTTCCCTTTTCTCC-3' (FRAG. NO:1916) (SEQ ID NO:11298)
 5'-TTGTTTCCGTTTCTCTTG-3' (FRAG. NO:1917) (SEQ ID NO:11299)
 5'-CCGCTGTGGT-3' (FRAG. NO:1918) (SEQ ID NO:11300)
 5'-CCCGTTTGAAGTATGGC-3' (FRAG. NO:1919) (SEQ ID NO:11301)
 5'-GCTCCBCCAATTCCCTTTTCTCC-3' (FRAG. NO:1920) (SEQ ID NO:11302)
- C/EBPNucleic Acids and Antisense Oligonucleotide Antisense Oligonucleotide Fragments**
 5'-GGGCCCBGCCCCGCCGCTTTTCTBGCCCC GGCC-3' (FRAG. NO:1921) (SEQ ID NO:11303)
 5'-GGGCCCBGCCCCGCCGCTTTTCTBGCCCC GGCC-3' (FRAG. NO:1922) (SEQ ID NO:11304)
 5'-GGGCCCBGCCCCGCCGCTTTTCTBGCCCCGG-3' (FRAG. NO:1923) (SEQ ID NO:11305)
 5'-GGGCCCBGCCCCGCCGCTTTTCTBGCCCCG-3' (FRAG. NO:1924) (SEQ ID NO:11306)
 5'-GGGCCCBGCCCCGCCGCTTTTCTBGCCCC-3' (FRAG. NO:1925) (SEQ ID NO:11307)
 5'-GGGCCCBGCCCCGCCGCTTTTCTBGCCCC-3' (FRAG. NO:1926) (SEQ ID NO:11308)
 5'-GGGCCCBGCCCCGCCGCTTTTCTBGCC-3' (FRAG. NO:1927) (SEQ ID NO:11309)
 5'-GGGCCCBGCCCCGCCGCTTTTCTBGCC-3' (FRAG. NO:1928) (SEQ ID NO:11310)
 5'-GGGCCCBGCCCCGCCGCTTTTCTBG-3' (FRAG. NO:1929) (SEQ ID NO:11311)
 5'-GGGCCCBGCCCCGCCGCTTTTCTB-3' (FRAG. NO:1930) (SEQ ID NO:11312)
 5'-GGGCCCBGCCCCGCCGCTTTTCT-3' (FRAG. NO:1931) (SEQ ID NO:11311) 1944)
 5'-GGGCCCBGCCCCGCCGCTTTTCT-3' (FRAG. NO:1932) (SEQ ID NO:11314)
 5'-GGGCCCBGCCCCGCCGCTTTT-3' (FRAG. NO:1933) (SEQ ID NO:11315)
 5'-GGGCCCBGCCCCGCCGCTTT-3' (FRAG. NO:1934) (SEQ ID NO:11316) [1945])
 5'-GGGCCCBGCCCCGCCGCTT-3' (FRAG. NO:1935) (SEQ ID NO:11317)
 5'-GGGCCCBGCCCCGCCGCT-3' (FRAG. NO:1936) (SEQ ID NO:11318)
 5'-GGGCCCBGCCCCGCCGCC-3' (FRAG. NO:1937) (SEQ ID NO:11319)
 5'-GGGCCCBGCCCCGCCGC-3' (FRAG. NO:1938) (SEQ ID NO:11320)
 5'-GGGCCCBGCCCCGCCG-3' (FRAG. NO:1939) (SEQ ID NO:11321)
 5'-GGGCCCBGCCCCGCC-3' (FRAG. NO:1940) (SEQ ID NO:11322)
 5'-GGGCCCBGCCCCG-3' (FRAG. NO:1941) (SEQ ID NO:11323)
 5'-GGGCCCBGCCCC-3' (FRAG. NO:1942) (SEQ ID NO:11324)
 5'-GGGCCCBGCCCC-3' (FRAG. NO:1943) (SEQ ID NO:11325)
 5'-GGGCCCBGCCCC-3' (FRAG. NO:1944) (SEQ ID NO:11326)
 5'-GGGCCBCCCCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1945) (SEQ ID NO:11327)
 5'-GCCCBGCCCCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1946) (SEQ ID NO:11328)
 5'-CCBGCCCCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1947) (SEQ ID NO:11329)
 5'-CCBGCCCCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1948) (SEQ ID NO:11330)
 5'-CBGCCCCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1948) (SEQ ID NO:11331)
 5'-BGCCCCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1950) (SEQ ID NO:11332)
 5'-GCCCCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1951) (SEQ ID NO:11333)
 5'-CCCCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1952) (SEQ ID NO:11334)
 5'-CCCCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1953) (SEQ ID NO:11335)
 5'-CCGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1954) (SEQ ID NO:11336)
 5'-CGCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1955) (SEQ ID NO:11337)
 5'-GCCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1956) (SEQ ID NO:11338)
 5'-CCGCTTTTCTBGCCCCGGC-3' (FRAG. NO:1957) (SEQ ID NO:11339)
 5'-CGCCTTTTCTBGCCCCGGC-3' (FRAG. NO:1958) (SEQ ID NO:11340)
 5'-GCCTTTTCTBGCCCCGGC-3' (FRAG. NO:1959) (SEQ ID NO:11341)
 5'-CCTTTTCTBGCCCCGGC-3' (FRAG. NO:1960) (SEQ ID NO:11342)
 5'-CTTTTCTBGCCCCGGC-3' (FRAG. NO:1961) (SEQ ID NO:11343)
 5'-TTTCTBGCCCCGGC-3' (FRAG. NO:1962) (SEQ ID NO:11344)
 5'-TTTCTBGCCCCGGC-3' (FRAG. NO:1963) (SEQ ID NO:11345)
 5'-TTCTBGCCCCGGC-3' (FRAG. NO:1964) (SEQ ID NO:11346)
 5'-TCTBGCCCCGGC-3' (FRAG. NO:1965) (SEQ ID NO:11347)
 5'-CTBGCCCCGGC-3' (FRAG. NO:1966) (SEQ ID NO:11348)
 5'-GCGBGGCTGTBCCTCGCTGGGCC-3' (FRAG. NO:1967) (SEQ ID NO:11349)
 5'-GCGBGGCTGTBCCTCGCTGGGCC-3' (FRAG. NO:1968) (SEQ ID NO:11350)
 5'-GCGBGGCTGTBCCTCGCTGGGC-3' (FRAG. NO:1969) (SEQ ID NO:11351)
 5'-GCGBGGCTGTBCCTCGCTGGG-3' (FRAG. NO:1970) (SEQ ID NO:11352)
 5'-GCGBGGCTGTBCCTCGTGG-3' (FRAG. NO:1971) (SEQ ID NO:11353)
 5'-GCGBGGCTGTBCCTCGTG-3' (FRAG. NO:1972) (SEQ ID NO:11354)
 5'-GCGBGGCTGTBCCTCGT-3' (FRAG. NO:1973) (SEQ ID NO:11355)
 5'-GCGBGGCTGTBCCTGCG-3' (FRAG. NO:1974) (SEQ ID NO:11356)
 5'-GCGBGGCTGTBCCTCG-3' (FRAG. NO:1975) (SEQ ID NO:11357)
 5'-GCGBGGCTGTBCCTC-3' (FRAG. NO:1976) (SEQ ID NO:11358)
 5'-GCGBGGCTGTBCCT-3' (FRAG. NO:1977) (SEQ ID NO:11359)

5'-GCGBGGCTGTCCB-3' (FRAG. NO:1978) (SEQ ID NO:11360)
5'-GCGBGGCTGTCCB-3' (FRAG. NO:1979) (SEQ ID NO:11361)
5'-GCGBGGCTGTCCB-3' (FRAG. NO:1980) (SEQ ID NO:11362)
5'-GCGBGGCTGTCCB-3' (FRAG. NO:1981) (SEQ ID NO:11363)
5'-GCGBGGCTGTCCB-3' (FRAG. NO:1982) (SEQ ID NO:11364)
5'-GCGBGGCTGTCCBCTCGCTGGGCCC-3' (FRAG. NO:1983) (SEQ ID NO:11365)
5'-GCGBGCTGTCCBCTCGCTGGGCCC-3' (FRAG. NO:1984) (SEQ ID NO:11366)
5'-GCGGCTGTCCBCTCGCTGGGCCC-3' (FRAG. NO:1985) (SEQ ID NO:11367)
5'-GCGGCTGTCCBCTCGCTGGGCCC-3' (FRAG. NO:1986) (SEQ ID NO:11368)
5'-GCTGTCCBCTCGCTGGGCCC-3' (FRAG. NO:1987) (SEQ ID NO:11369)
5'-GCTGTCCBCTCGCTGGGCCC-3' (FRAG. NO:1988) (SEQ ID NO:11370)
5'-GCTGTCCBCTCGCTGGGCCC-3' (FRAG. NO:1989) (SEQ ID NO:11371)
5'-GTCBCTCGCTGGGCCC-3' (FRAG. NO:1990) (SEQ ID NO:11372)
5'-TCBCTCGCTGGGCCC-3' (FRAG. NO:1991) (SEQ ID NO:11373)
5'-CBCCTCGCTGGGCCC-3' (FRAG. NO:1992) (SEQ ID NO:11374)
5'-BCCTCGCTGGGCCC-3' (FRAG. NO:1993) (SEQ ID NO:11375)
5'-CCTCGCTGGGCCC-3' (FRAG. NO:1994) (SEQ ID NO:11376)
5'-CTCGCTGGGCCC-3' (FRAG. NO:1995) (SEQ ID NO:11377)
5'-TCGCTGGGCCC-3' (FRAG. NO:1996) (SEQ ID NO:11378)
5'-CGCTGGGCCC-3' (FRAG. NO:1997) (SEQ ID NO:11379)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:1998) (SEQ ID NO:11380)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:1999) (SEQ ID NO:11381)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCGGG-3' (FRAG. NO:2000) (SEQ ID NO:11382)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCGG-3' (FRAG. NO:2001) (SEQ ID NO:11383)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2002) (SEQ ID NO:11384)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2003) (SEQ ID NO:11385)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2004) (SEQ ID NO:11386)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2005) (SEQ ID NO:11387)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2006) (SEQ ID NO:11388)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2007) (SEQ ID NO:11389)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2008) (SEQ ID NO:11390)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2009) (SEQ ID NO:11391)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2010) (SEQ ID NO:11392)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2011) (SEQ ID NO:11393)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2012) (SEQ ID NO:11394)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCG-3' (FRAG. NO:2013) (SEQ ID NO:11395)
5'-GCGCGGCGCTCBTGGG-3' (FRAG. NO:2014) (SEQ ID NO:11396)
5'-GCGCGGCGCTCBTGG-3' (FRAG. NO:2015) (SEQ ID NO:11397)
5'-GCGCGGCGCTCBT-3' (FRAG. NO:2016) (SEQ ID NO:11398)
5'-GCGCGGCGCTCB-3' (FRAG. NO:2017) (SEQ ID NO:11399)
5'-GCGCGGCGCTC-3' (FRAG. NO:2018) (SEQ ID NO:11400)
5'-GCGCGGCGCT-3' (FRAG. NO:2019) (SEQ ID NO:11401)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2020) (SEQ ID NO:11402)
5'-GCGCGGCGCTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2021) (SEQ ID NO:11403)
5'-GCGCGGCTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2022) (SEQ ID NO:11404)
5'-GGCGGCTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2023) (SEQ ID NO:11405)
5'-GCCGCTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2024) (SEQ ID NO:11406)
5'-CCGTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2025) (SEQ ID NO:11407)
5'-CGTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2026) (SEQ ID NO:11408)
5'-GTCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2027) (SEQ ID NO:11409)
5'-TCBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2028) (SEQ ID NO:11410)
5'-CBTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2029) (SEQ ID NO:11411)
5'-BTGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2030) (SEQ ID NO:11412)
5'-TGGCGGCGTCGGGCGGGG-3' (FRAG. NO:2031) (SEQ ID NO:11413)
5'-GGCGGCGTCGGGCGGGG-3' (FRAG. NO:2032) (SEQ ID NO:11414)
5'-GCGGCGTCGGGCGGGG-3' (FRAG. NO:2033) (SEQ ID NO:11415)
5'-CGGCGTCGGGCGGGG-3' (FRAG. NO:2034) (SEQ ID NO:11416)
5'-GGCGTCGGGCGGGG-3' (FRAG. NO:2035) (SEQ ID NO:11417)
5'-GCGTCGGGCGGGG-3' (FRAG. NO:2036) (SEQ ID NO:11418)
5'-CGTCGGGCGGGG-3' (FRAG. NO:2037) (SEQ ID NO:11419)
5'-GTCGGGCGGGG-3' (FRAG. NO:2038) (SEQ ID NO:11420)
5'-TCGGGCGGGG-3' (FRAG. NO:2039) (SEQ ID NO:11421)
5'-CGGGCGGGG-3' (FRAG. NO:2040) (SEQ ID NO:11422)
5'-CCGCBGCGGCGGCGCGCGCGCGCGGGG-3' (FRAG. NO:2041) (SEQ ID NO:11423)
5'-CCGCBGCGGCGGCGCGCGCGCGCGGGG-3' (FRAG. NO:2042) (SEQ ID NO:11424)
5'-CCGCBGCGGCGGCGCGCGCGCGGGG-3' (FRAG. NO:2043) (SEQ ID NO:11425)
5'-CCGCBGCGGCGGCGCGCGCGCGGGG-3' (FRAG. NO:2044) (SEQ ID NO:11426)
5'-CCGCBGCGGCGGCGCGCGCGCGGGG-3' (FRAG. NO:2045) (SEQ ID NO:11427)
5'-CCGCBGCGGCGGCGCGCGCGGGG-3' (FRAG. NO:2046) (SEQ ID NO:11428)
5'-CCGCBGCGGCGGCGCGCGCGGGG-3' (FRAG. NO:2047) (SEQ ID NO:11429)
5'-CCGCBGCGGCGGCGCGCGCGGGG-3' (FRAG. NO:2048) (SEQ ID NO:11430)
5'-CCGCBGCGGCGGCGCGCGCGGGG-3' (FRAG. NO:2049) (SEQ ID NO:11431)
5'-CCGCBGCGGCGGCGCGCGCGGGG-3' (FRAG. NO:2050) (SEQ ID NO:11432)
5'-CCGCBGCGGCGGCGCGCGCGGGG-3' (FRAG. NO:2051) (SEQ ID NO:11433)
5'-CCGCBGCGGCGGCGCGCGCGGGG-3' (FRAG. NO:2052) (SEQ ID NO:11434)

- 5'-CCGCBGGCCBGGGCGCGCCG-3' (FRAG. NO:2053) (SEQ ID NO:11435)
5'-CCGCBGGCCBGGGCGCGCC-3' (FRAG. NO:2054) (SEQ ID NO:11436)
5'-CCGCBGGCCBGGGCGCGC-3' (FRAG. NO:2055) (SEQ ID NO:11437)
5'-CCGCBGGCCBGGGCGCG-3' (FRAG. NO:2056) (SEQ ID NO:11438)
5 5'-CCGCBGGCCBGGGCGC-3' (FRAG. NO:2057) (SEQ ID NO:11439)
5'-CCGCBGGCCBGGGCG-3' (FRAG. NO:2058) (SEQ ID NO:11440)
5'-CCGCBGGCCBGGGC-3' (FRAG. NO:2059) (SEQ ID NO:11441)
5'-CCGCBGGCCBGGG-3' (FRAG. NO:2060) (SEQ ID NO:11442)
5'-CCGCBGGCCBGG-3' (FRAG. NO:2061) (SEQ ID NO:11443)
10 5'-CCGCBGGCCBG-3' (FRAG. NO:2062) (SEQ ID NO:11444)
5'-CCGCBGGCCB-3' (FRAG. NO:2063) (SEQ ID NO:11445)
5'-CCGCBGGCC-3' (FRAG. NO:2064) (SEQ ID NO:11446)
5'-CGCBGGCCBGGGCGCGCCGCGCGCGCG-3' (FRAG. NO:2065) (SEQ ID NO:11447)
5'-GCBGGCCBGGGCGCGCCGCGCGCGCGCGCG-3' (FRAG. NO:2066) (SEQ ID NO:11448)
15 5'-CBGGCCBGGGCGCGCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2067) (SEQ ID NO:11449)
5'-BGGCCBGGGCGCGCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2068) (SEQ ID NO:11450)
5'-GGCCBGGGCGCGCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2069) (SEQ ID NO:11451)
5'-GCCBGGGCGCGCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2070) (SEQ ID NO:11452)
5'-CCBGGGCGCGCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2071) (SEQ ID NO:11453)
20 5'-CBGGGCGCGCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2072) (SEQ ID NO:11454)
5'-BGGGCGCGCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2073) (SEQ ID NO:11455)
5'-GGGCGCGCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2074) (SEQ ID NO:11456)
5'-GGGCGCGCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2075) (SEQ ID NO:11457)
5'-CGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2076) (SEQ ID NO:11458)
25 5'-CGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2077) (SEQ ID NO:11459)
5'-GCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2078) (SEQ ID NO:11460)
5'-CGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2079) (SEQ ID NO:11461)
5'-GCCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2080) (SEQ ID NO:11462)
5'-CCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2081) (SEQ ID NO:11463)
30 5'-CGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2082) (SEQ ID NO:11464)
5'-GCCGCGCGCGCGCGCGCG-3' (FRAG. NO:2083) (SEQ ID NO:11465)
5'-CCGCGCGCGCGCGCGCG-3' (FRAG. NO:2084) (SEQ ID NO:11466)
5'-CGCGCGCGCGCGCGCG-3' (FRAG. NO:2085) (SEQ ID NO:11467)
5'-GGCGCGCGCGCGCGCG-3' (FRAG. NO:2086) (SEQ ID NO:11468)
35 5'-GGCGCGCGCGCGCGCG-3' (FRAG. NO:2087) (SEQ ID NO:11469)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2088) (SEQ ID NO:11470)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2089) (SEQ ID NO:11471)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2090) (SEQ ID NO:11472)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2091) (SEQ ID NO:11473)
40 5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2092) (SEQ ID NO:11474)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2093) (SEQ ID NO:11475)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2094) (SEQ ID NO:11476)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2095) (SEQ ID NO:11477)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2096) (SEQ ID NO:11478)
45 5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2097) (SEQ ID NO:11479)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2098) (SEQ ID NO:11480)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2099) (SEQ ID NO:11481)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2100) (SEQ ID NO:11482)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2101) (SEQ ID NO:11483)
50 5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2102) (SEQ ID NO:11484)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2103) (SEQ ID NO:11485)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2104) (SEQ ID NO:11486)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2105) (SEQ ID NO:11487)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2106) (SEQ ID NO:11488)
55 5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2107) (SEQ ID NO:11489)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2108) (SEQ ID NO:11490)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2109) (SEQ ID NO:11491)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2110) (SEQ ID NO:11492)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2111) (SEQ ID NO:11493)
60 5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2112) (SEQ ID NO:11494)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2113) (SEQ ID NO:11495)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2114) (SEQ ID NO:11496)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2115) (SEQ ID NO:11497)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2116) (SEQ ID NO:11498)
65 5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2117) (SEQ ID NO:11499)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2118) (SEQ ID NO:11500)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2119) (SEQ ID NO:11501)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2120) (SEQ ID NO:11502)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2121) (SEQ ID NO:11503)
70 5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2122) (SEQ ID NO:11504)
5'-GGGCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2123) (SEQ ID NO:11505)
5'-GCCCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2124) (SEQ ID NO:11506)
5'-CCCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2125) (SEQ ID NO:11507)
5'-CCCGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2126) (SEQ ID NO:11508)
75 5'-CCTGCGCGCGCGCGCGCGCGCGCGCGCG-3' (FRAG. NO:2127) (SEQ ID NO:11509)

- 5'-CTGGCTCGGGCCCCGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2128) (SEQ ID NO:11510)
 5'-TGCTCGGGCCCCGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2129) (SEQ ID NO:11511)
 5'-GGCTCGGGCCCCGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2130) (SEQ ID NO:11512)
 5'-GCTCGGGCCCCGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2131) (SEQ ID NO:11513)
 5'-CTCGGGCCCCGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2132) (SEQ ID NO:11514)
 5'-TCGGCCCCGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2133) (SEQ ID NO:11515)
 5'-CGCCCCGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2134) (SEQ ID NO:11516)
 5'-GGCCCCGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2135) (SEQ ID NO:11517)
 5'-GCCCGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2136) (SEQ ID NO:11518)
 5'-CCCCGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2137) (SEQ ID NO:11519)
 5'-CCCGGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2138) (SEQ ID NO:11520)
 5'-CCGGGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2139) (SEQ ID NO:11521)
 5'-CGCGGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2140) (SEQ ID NO:11522)
 5'-GCGGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2141) (SEQ ID NO:11523)
 5'-CGGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2142) (SEQ ID NO:11524)
 5'-GGCGGGCCCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2143) (SEQ ID NO:11525)
 5'-GCCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2144) (SEQ ID NO:11526)
 5'-CCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2145) (SEQ ID NO:11527)
 5'-CCGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2146) (SEQ ID NO:11528)
 5'-CGGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2147) (SEQ ID NO:11529)
 5'-GGCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2148) (SEQ ID NO:11530)
 5'-GCTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2149) (SEQ ID NO:11531)
 5'-CTTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2150) (SEQ ID NO:11532)
 5'-TTGCCCCCGCCGGCCCGG-3' (FRAG. NO:2151) (SEQ ID NO:11533)
 5'-TGCCCCCGCCGGCCCGG-3' (FRAG. NO:2152) (SEQ ID NO:11534)
 5'-GCCCGCCCCGGCCCGG-3' (FRAG. NO:2153) (SEQ ID NO:11535)
 5'-CCCGCCCCGGCCCGG-3' (FRAG. NO:2154) (SEQ ID NO:11536)
 5'-CCCGCCCCGGCCCGG-3' (FRAG. NO:2155) (SEQ ID NO:11537)
 5'-CGCCCCGGCCCGG-3' (FRAG. NO:2156) (SEQ ID NO:11538)
 5'-GCCCGCCCCGG-3' (FRAG. NO:2157) (SEQ ID NO:11539)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2158) (SEQ ID NO:11540)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2159) (SEQ ID NO:11541)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCCTBGGGCC-3' (FRAG. NO:2160) (SEQ ID NO:11542)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCCTBGGGC-3' (FRAG. NO:2161) (SEQ ID NO:11543)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCCTBGGG-3' (FRAG. NO:2162) (SEQ ID NO:11544)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCCTBGG-3' (FRAG. NO:2163) (SEQ ID NO:11545)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCCTBG-3' (FRAG. NO:2164) (SEQ ID NO:11546)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCCTB-3' (FRAG. NO:2165) (SEQ ID NO:11547)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCCT-3' (FRAG. NO:2166) (SEQ ID NO:11548)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGCC-3' (FRAG. NO:2167) (SEQ ID NO:11549)
 5'-GGCGGGGGCGGCGGCGCTGGCTCGC-3' (FRAG. NO:2168) (SEQ ID NO:11550)
 5'-GGCGGGGGCGGCGGCGCTGGCTCG-3' (FRAG. NO:2169) (SEQ ID NO:11551)
 5'-GGCGGGGGCGGCGGCGCTGGCTC-3' (FRAG. NO:2170) (SEQ ID NO:11552)
 5'-GGCGGGGGCGGCGGCGCTGGCT-3' (FRAG. NO:2171) (SEQ ID NO:11553)
 5'-GGCGGGGGCGGCGGCGCTGGC-3' (FRAG. NO:2172) (SEQ ID NO:11554)
 5'-GGCGGGGGCGGCGGCGCTGG-3' (FRAG. NO:2173) (SEQ ID NO:11555)
 5'-GGCGGGGGCGGCGGCGCTG-3' (FRAG. NO:2174) (SEQ ID NO:11556)
 5'-GGCGGGGGCGGCGGCGCT-3' (FRAG. NO:2175) (SEQ ID NO:11557)
 5'-GGCGGGGGCGGCGGCGC-3' (FRAG. NO:2176) (SEQ ID NO:11558)
 5'-GGCGGGGGCGGCGGCG-3' (FRAG. NO:2177) (SEQ ID NO:11559)
 5'-GGCGGGGGCGGCGGC-3' (FRAG. NO:2178) (SEQ ID NO:11560)
 5'-GGCGGGGGCGGCGG-3' (FRAG. NO:2179) (SEQ ID NO:11561)
 5'-GGCGGGGGCGGCG-3' (FRAG. NO:2180) (SEQ ID NO:11562)
 5'-GGCGGGGGCGGC-3' (FRAG. NO:2181) (SEQ ID NO:11563)
 5'-GGCGGGGGCGG-3' (FRAG. NO:2182) (SEQ ID NO:11564)
 5'-GGCGGGGGCG-3' (FRAG. NO:2183) (SEQ ID NO:11565)
 5'-GCGGGGGCGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2184) (SEQ ID NO:11566)
 5'-CGGGGGCGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2185) (SEQ ID NO:11567)
 5'-GGGGGGCGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2186) (SEQ ID NO:11568)
 5'-GGGGGGCGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2187) (SEQ ID NO:11569)
 5'-GGGGGGCGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2188) (SEQ ID NO:11570)
 5'-GGGGGGCGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2189) (SEQ ID NO:11571)
 5'-GCGGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2190) (SEQ ID NO:11572)
 5'-CGGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2191) (SEQ ID NO:11573)
 5'-GGGGGGCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2192) (SEQ ID NO:11574)
 5'-GCGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2193) (SEQ ID NO:11575)
 5'-CGGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2194) (SEQ ID NO:11576)
 5'-GGCGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2195) (SEQ ID NO:11577)
 5'-GCCCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2196) (SEQ ID NO:11578)
 5'-CGCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2197) (SEQ ID NO:11579)
 5'-GCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2198) (SEQ ID NO:11580)
 5'-CCTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2199) (SEQ ID NO:11581)
 5'-CTGGCTCGCCTBGGGCCCC-3' (FRAG. NO:2200) (SEQ ID NO:11582)
 5'-TGCTCGCCTBGGGCCCC-3' (FRAG. NO:2201) (SEQ ID NO:11583)
 5'-GGCTCGCCTBGGGCCCC-3' (FRAG. NO:2202) (SEQ ID NO:11584)

- 5'-GCTCGCCTBGGGCCCC-3' (FRAG. NO:2203) (SEQ ID NO:11585)
 5'-CTCGCCTBGGGCCCC-3' (FRAG. NO:2204) (SEQ ID NO:11586)
 5'-TCGCCTBGGGCCCC-3' (FRAG. NO:2205) (SEQ ID NO:11587)
 5'-CGCCTBGGGCCCC-3' (FRAG. NO:2206) (SEQ ID NO:11588)
 5'-GCCTBGGGCCCC-3' (FRAG. NO:2207) (SEQ ID NO:11589)
 5'-CCTBGGGCCCC-3' (FRAG. NO:2208) (SEQ ID NO:11590)
 5'-CTBGGGCCCC-3' (FRAG. NO:2209) (SEQ ID NO:11591)
 5'-GGGTGGGCBGCGCGGCC-3' (FRAG. NO:2210) (SEQ ID NO:11592)
 5'-GGTCGGCGBBGBGCTCGTCGTGGC-3' (FRAG. NO:2211) (SEQ ID NO:11593)
 5'-GGTCGGCGBBGBGCTCGTCGTGG-3' (FRAG. NO:2212) (SEQ ID NO:11594)
 5'-GGTCGGCGBBGBGCTCGTCGTG-3' (FRAG. NO:2213) (SEQ ID NO:11595)
 5'-GGTCGGCGBBGBGCTCGTCGT-3' (FRAG. NO:2214) (SEQ ID NO:11596)
 5'-GGTCGGCGBBGBGCTCGTCG-3' (FRAG. NO:2215) (SEQ ID NO:11597)
 5'-GGTCGGCGBBGBGCTCGTC-3' (FRAG. NO:2216) (SEQ ID NO:11598)
 5'-GGTCGGCGBBGBGCTCGT-3' (FRAG. NO:2217) (SEQ ID NO:11599)
 5'-GGTCGGCGBBGBGCTCG-3' (FRAG. NO:2218) (SEQ ID NO:11600)
 5'-GGTCGGCGBBGBGCTC-3' (FRAG. NO:2219) (SEQ ID NO:11601)
 5'-GGTCGGCGBBGBGCT-3' (FRAG. NO:2220) (SEQ ID NO:11602)
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 5'-GGTCGGCGBBGBG-3' (FRAG. NO:2222) (SEQ ID NO:11604)
 5'-GGTCGGCGBBGB-3' (FRAG. NO:2223) (SEQ ID NO:11605)
 5'-GGTCGGCGBBG-3' (FRAG. NO:2224) (SEQ ID NO:11606)
 5'-GTCGGCGBBGBGCTCGTCGTGGC-3' (FRAG. NO:2225) (SEQ ID NO:11607)
 5'-TCGGCGBBGBGCTCGTCGTGGC-3' (FRAG. NO:2226) (SEQ ID NO:11608)
 5'-CGGCGBBGBGCTCGTCGTGGC-3' (FRAG. NO:2227) (SEQ ID NO:11609)
 5'-GGCGBBGBGCTCGTCGTGGC-3' (FRAG. NO:2228) (SEQ ID NO:11610)
 5'-GCGBBGBGCTCGTCGTGGC-3' (FRAG. NO:2229) (SEQ ID NO:11611)
 5'-CBBGBGCTCGTCGTGGC-3' (FRAG. NO:2230) (SEQ ID NO:11612)
 5'-GBBGBGCTCGTCGTGGC-3' (FRAG. NO:2231) (SEQ ID NO:11613)
 5'-BGBGBGCTCGTCGTGGC-3' (FRAG. NO:2232) (SEQ ID NO:11614)
 5'-BGBGCTCGTCGTGGC-3' (FRAG. NO:2233) (SEQ ID NO:11615)
 5'-GBGCTCGTCGTGGC-3' (FRAG. NO:2234) (SEQ ID NO:11616)
 5'-BGCTCGTCGTGGC-3' (FRAG. NO:2235) (SEQ ID NO:11617)
 5'-GCTCGTCGTGGC-3' (FRAG. NO:2236) (SEQ ID NO:11618)
 5'-CTCGTCGTGGC-3' (FRAG. NO:2237) (SEQ ID NO:11619)
 5'-TCGTCGTGGC-3' (FRAG. NO:2238) (SEQ ID NO:11620)
 5'-GGGGCCCCGCGCCCGCC-3' (FRAG. NO:2239) (SEQ ID NO:11621)
 5'-GGGGCCCCGCGCCCGCC-3' (FRAG. NO:2240) (SEQ ID NO:11622)
 5'-GGGGCCCCGCGCCCGCC-3' (FRAG. NO:2241) (SEQ ID NO:11623)
 5'-GGGGCCCCGCGCCCGCC-3' (FRAG. NO:2242) (SEQ ID NO:11624)
 5'-GGGGCCCCGCGCCCGCC-3' (FRAG. NO:2243) (SEQ ID NO:11625)
 5'-GGGGCCCCGCGCCCGC-3' (FRAG. NO:2244) (SEQ ID NO:11626)
 5'-GGGGCCCCGCGCCG-3' (FRAG. NO:2245) (SEQ ID NO:11627)
 5'-GGGGCCCCGCGC-3' (FRAG. NO:2246) (SEQ ID NO:11628)
 5'-GGGGCCCCGCG-3' (FRAG. NO:2247) (SEQ ID NO:11629)
 5'-GGGGCCCCGCGCCCGCC-3' (FRAG. NO:2248) (SEQ ID NO:11630)
 5'-GGCCCCGCGCCCGCC-3' (FRAG. NO:2249) (SEQ ID NO:11631)
 5'-GCCCCGCGCCCGCC-3' (FRAG. NO:2250) (SEQ ID NO:11632)
 5'-CCCCGCGCCCGCC-3' (FRAG. NO:2251) (SEQ ID NO:11633)
 5'-CCCGCGCCCGCC-3' (FRAG. NO:2252) (SEQ ID NO:11634)
 5'-CCGCGCCCGCC-3' (FRAG. NO:2253) (SEQ ID NO:11635)
 5'-CGCGCCCGCC-3' (FRAG. NO:2254) (SEQ ID NO:11636)
 5'-GCGCCCGCC-3' (FRAG. NO:2255) (SEQ ID NO:11637)
 5'-CGCCCGCC-3' (FRAG. NO:2256) (SEQ ID NO:11638)
 5'-GCCCGCC-3' (FRAG. NO:2257) (SEQ ID NO:11639)
 5'-GGGGCGCGGGGCGCGG-3' (FRAG. NO:2258) (SEQ ID NO:11640)
 5'-GGCGGGGCGGGCGGGCGGGCC-3' (FRAG. NO:2259) (SEQ ID NO:11641)
 5'-GGCGCGTCGCGCTCGCCCBGTCGGGCTCGCGC-3' (FRAG. NO:2260) (SEQ ID NO:11642)
 5'-GCGCGGCBBCBGCGBGCGGGCGCG-3' (FRAG. NO:2261) (SEQ ID NO:11643)
 5'-GCGCBGCGGGCCCTGCGCGGGC-3' (FRAG. NO:2262) (SEQ ID NO:11644)
 5'-GGGCGGGGTGGGCTGCCCTGCGGCGCC-3' (FRAG. NO:2263) (SEQ ID NO:11645)
 5'-GGGCTGCTGCGCGGCGGCTCCGGCGA-3' (FRAG. NO:2264) (SEQ ID NO:11646)
 5'-CTCCCGGGCGGGCGGGCGGGG-3' (FRAG. NO:2265) (SEQ ID NO:11647)
 5'-GGGCTGCGCGGTCCGGGCCCCCTTGTCCGGCG-3' (FRAG. NO:2266) (SEQ ID NO:11648)
 5'-GCGCTGCGCGGCTGCCG-3' (FRAG. NO:2267) (SEQ ID NO:11649)
 5'-GCGCGCTTGGCTTGTGCGGC-3' (FRAG. NO:2268) (SEQ ID NO:11650)
 5'-GCTGTCCBCGCGCTG-3' (FRAG. NO:2269) (SEQ ID NO:11651)
 5'-GCCGGBGGCCGGCCBGGTCCCGC-3' (FRAG. NO:2270) (SEQ ID NO:11652)
 5'-CCCGGCGCGGCBGGBGGGCGGCTGGG-3' (FRAG. NO:2271) (SEQ ID NO:11653)
 5'-GTCTCTCCCGCCCGCGCGC-3' (FRAG. NO:2272) (SEQ ID NO:11654)
 5'-GGGCGTCCGCTCCGGGCGTGGG-3' (FRAG. NO:2273) (SEQ ID NO:11655)
 5'-GCGGCAACGCGGCTGGCGTGGC-3' (FRAG. NO:2274) (SEQ ID NO:11656)

Bradykinin Receptor Nucleic Acids and Antisense Oligonucleotide Fragments

- 5'-GGTGBCBTTG BGCBTGTCGG CGCGTCCCG TTBBBGTGG GCCCGCCAGC CCAGCCACTC CACTTGGGGG CGGGTGGCCA
 GCACGAACAG CACCCAGAGG AAGGGGGGCG GCCAGAAGG GCAGCCCGCA GGCCAGGATC AGGTCTGCTG CGGCCGAGA

TAATGGCATT CACCACGCGG CGGCCACGCG CACGCCGCGC ATCCGGGCCG GGTCTGACC TGCAGCCCCC GTCTCCTTGG
 CATTCCTGGG CCCAGTCCAC TCCTCTCCCT GCGCCCTCTG CTGGGGCAGG GACGGGGTG BCBTTGBGCB TGTCGGCGCG
 GTCCCGTTBB GBGTGGGCCC GCCAGCCAG CCACCTCACT TGGGGGCGGG TGGCCAGCAC GAACAGCACC CAGAGGAAGG
 5 GGGGGGCGCC AGAAGGGCAG CCGCAGGCC AGGATCAGGT CTGCTCGCGC CGGAGATAAT GGCATTACAC ACGCGCGCGC
 CCAGCGCAGC CCGCGCATCC GGCCCGGGTT CTGACCTGCA GCGCCCGTCT CTTGGGCATT CTTGGGCCCC AGTCACTCCT
 CTCCTGCCCC CCCTTGCTGG GGCAGGGACG GCCGTGTGTG CBGTGGTGCT GCGCGTTTGB GGTBTGGCGC TCCBCCBBTT
 CCCTTTTCTC CTTGTTTTCC GTTCTCTTG CCGTCTGTGG TT CAGATTACAA AACTGCAGGA CTGGGCGAGG AGCAGACAGT
 GAGCAAAACG CAGCAGGGCT GCTGTGAATT TGTGTAAAGG TTGAGGGACA GTTGTCTTTC AGCATGGGCC CAGGAATGCC
 10 AAGGAGACAT CTATGCACGA CCTTGGGAAA TGAGTTGATG TCTCCGGTAA AACACCGGAG ACTAATTCCT GCCCTGCCCA
 ATTTTGCAGG GAGCATGGCT GTGAGGATGG GGTGAACCTA CGCACAGCCA AGGACTCCAA AATCACAACA GCATTACTGT
 TCTTATTGTC TGCCACACCT GAGCCAGCCT GCTCCTTCCC AGGAGTGGAG GAGGCTGGG GGGAGGGAGA GGAGTGACTG
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 GCAATGGCTG AGTGCACAAAG TGAGTTGTTG CCGTGGGTTT CTTTAATCTA TTCAGCTAGA AGTTTGAAGG ACAATTTCTT
 GCATTAATAA AGGTTAAGCC CTGAGGGGTC CCTGATAACA ACCTGGAGAC CAGGATTTTA TGGTCCCTT CACTGATGGA
 15 CAAGGAGGTC TGTGCCAAAG AAGAATCCAA TAAGCACATA TTGAGCACTT GCTGTATATG CAGTATTGAG CACTGTAGGC
 AAGACCCAAG AAAGAGAAGG AGCCATCTCC ATCTTGAAGG AACTCAAAGA CTCAAGTGGG AAGCACTGGG CACTGCCACC
 ACCAGAGGCC AGAAGCTGGA GACGGTCGAG CAGGCTGTCT TGGTGTATAT GGACAGCAGA AGGGGAGAGC TAGAATTCOA
 GCTCAACCAA TAACATTGTC ACAACACCT GTCCCTGCCT CAGTTCCCTT TTATGTAACA TGAAGTCGTT GTGAGGGTTA
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 20 GGATATGTTT ACTATAAGGA AAAGACACTG AGGTCTAGAA ATAGTCCCTG GGAGCAGAAT CAGTATTGGG AGCCGTAGGC
 GGTGTGAAGC ACCAGTGTCT GGCACACAGT AGGTGCTCAT TGGTCCCTT CCACCTGTCA TTCCACCAC CCTGAGGCC
 CAACCGCCAC ACACACAGGA GCATTGTGGAG AGAAGGCCAT GTCTTCAAAG TCTGATTTGT GATGAGGCAG AGGAAGATAT
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 30 AACCTGGAGG GCTAGAACCT AGAAGGGCTA GAACCTGGAG GGCTAGAACCT TGGCAGGTTA GAACCTAGAA GGGCTAGAAC
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 GGGCAAGAGC CCATAAATCC TGACCAATCC AACTCTGAAT TTAAAGCAA AAGCGTGAAG AAAAAGATTG CCTCTTACC
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 35 AGTAAAAACC ATTTAGTATT AGTATTAGAA TGAAGTCAA CTGTGCCACA CATGGTGAAT GAAAAAAGG AAAAAAGAGG
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 40 CQAGAAAATC ATGTAAACAT GTGTCTTTT TGTAGAGCAT AATAAATGGA TGAGGTTTTT GCAAAAAAAA AAAAAAAA
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 45 TCTATGAGCC CAGGAGGGCC TCTCAGAGAG GAAAGCTCT AGGTCTTCT TCCCTCTGC AAACCTCCTG CTTGAAGGT
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 50 GCAGAGTGGC TGAAAGCTGG GATGTGGCAG ATCCGTGGCT ACATTCATGC ACACACACAC ACCACATAC CCACACATGC
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 60 TCCTTGCTTC CACTCTACCC CCACTGCAGT CTGACTTCC TGAGCAGCAG CCAGGGCCTA ATCGATATTC ACACCAAGCG
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30 AAAAAAATG TTTTGAAGT CCCTGCCCTT TCCAGCTCTC ACCGTCTCAG CCCTGGGAGT GTAAAGTGTG GCAGATAGTT
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CGGCCCGTG TCTCAGGGGA GCGCAACAC CCGTACCCAG GAAACAGGAC AGCTTCTGCC ACTGTGCCCC TTGGGAGCCG
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35 CAAATTTAAT CACATGGGGC TTCCAGGCC ACTTGTGGT CAGCGGGAG GGACGTTTTT GCGTCCAC GACTCCACG
GGCAGCCGGG CCTACGCAAA CATGGAATC TTCCAAGAGC CTCCCTGGCC CCAAGGGCTC AGAGGGTGGC AGAGCGGAGA
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AGGGGGAAGT GCCCAGGAG CTGATGACAT CACTACCCAG CCCTTCAAAG ATGAGCTGTT CCGCGCCCA CTTCCAGTCT
40 GGTCTCTGGG CTCCGAGGAG GGTGGGGAC GGTGGTGACG GTGGGGACAT CAGGCTGCCC CGCAGTACCA GGGAGCGACT
GAAGTGCCCA TGCCGCTTGC TCCGAGAGAG GTGGGTGCCG GGCAGGGGCT GCTCCAGCCG CCTCACTCT GCTGGAGGA
CAAACTGCTC CAGCACAGAG GGAGGGAGG AGGGCAGCA CCGGGAGAA GTTCCCTGT GGTCTGGGG AGTTGGGAAA
AGTTCCCTTC CTCCGAGG GAGG-3' (FRAG. NO:2275) (SEQ ID NO:11821)
5'- GCCCTTCAA GATGAGCTGT TCCCGCCGCC ACTCAGCTC TGCTTCTGG GCTCCGAGGA GGGGTGGGA CCGTGGTGAC
GGTGGGGACA TCAGGCTGCC CCGCAGTACC AGGGAGCGAC TGAAGTGCC ATGCCGCTT CTCCGGAGAA GGTGGGTGCC
45 GGGCAGGGC TGCTCCAGCC GCCTCACCTG TGCTGGAGG ACAAACCTG CAGCACAGA GGGAGGGAG GAGGGCAGCC
AGCGGGGAGA AGTTTCCCTG TGGTCTGGG GAGTT-3' (FRAG. NO:2275) (SEQ ID NO:11820)
5'- GCCCTTCAA GATGAGCTGT TCCCGCCGCC ACTCAGCTC TGCTTCTGG GCTCCGAGGA GGGGTGGGA CCGTGGGGAC
ATCAGCTGAG CCCGAGTAC CAGGGAGCGA CTGAAGTCC CATGCCGCTT GCTCCGAGA AGTGGGTGCC CCGGAGGGG
CTGCTCCAGC GCCTCACCT CTGCTGGAG GACAACTGT CCCAGCACAG AGGAGGGAG GGAGGGCAGG CAGCGGGAG
50 AAGTTTCCCT GTGGTCTGG GAGATT-3' (FRAG. NO:2275) (SEQ ID NO:11819)
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GTCTTCTGCC TGCAAAAGAG CAGCTGCACG GTGGCAGAGA TCTACTGGG GAACCTGGCC GCAGCAGACC TGATCTGGC
55 CTGCGGCTG CCGTCTGGG CCATCACCAT CTCCAACA TCTGACTGGC TCTTGGGA GACGCTCTGC CGCTGGTGA
ATGCCATTAT CTCCATGAAC CTGTACAGCA GCATCTGTTT CCGATGCTG GTGAGCATCG ACCGTACCTT GGCCCTGGTG
AAAACCATGT CCATGGGCCG GATGCGCGG GTGCGCTGG CCAAGCTCTA CAGCTTGGTG ATCTGGGGT GTACGCTGCT
CCTGAGCTCA CCCATGCTGG TGTTCGGAC CATGAAGGAG TACAGCGATG AGGGCCACAA CGTCACCGCT TGTGTCATCA
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60 ACCTTCTGCA CGATGCAGAT CATGCAAGTG CTGGGAACA ACGAGATGCA GAAGTTCAAG GAGATCCAGA CCGAGAGGAG
GGCCACGGTG CTAGTCTGG TTGTGCTGT GCTATTTCAT ATCTGCTGGC TGCCCTTCCA GATCAGCACC TTCCCTGGTA
CGCTGCATC CCGCGCATC CTCTCCAGT GCCAGACGA TCGCATCATC GATGTAATCA CACAGATGCG CTCTCTCATG
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65 TCTCCGTGGA ACGCCAGATT CACAACTGC AGGACTGGG AGGGAGCAGA CAGTGAGCAA ACGCCAGCAG GGCTGCTGTG
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5'- ATGTTCTCTC CTTGGAAGAT ATCAATGTTT CTGTCTGTT GTGAGGACTC CGTGCCACC ACGCCCTCTT TCAGCGCCGA
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70 GCTGGTCAA CACCATCCAG CCCCCCTTCC TCTGGTGCT GTTCTGTCT GCCACCTAG AGAACATCTT TGTCTCAGC
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CTGCGGCTG CCGTCTGGG CCATCACCAT CTCCAACA TCTGACTGGC TCTTGGGA GACGCTCTGC CGCTGGTGA
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CCTGAGCTCA CCCATGCTGG TGTTCGGAC CATGAAGGAG TACAGCGATG AGGGCCACAA CGTCACCGCT TGTGTCATCA
75 OCTACCCATC CCTCATCTGG GAAGTGTTC CCAACATGCT CCGTAATGTC GTGGGCTTCC TGCTGCCCT GAGTGTATC

ACCTTCTGCA CGATGCAGAT CATGCAGGTG CTGCGGAACA ACGAGATGCA GAAATTCAAG GAGATCCAGA CGGAGAGGAG
 GGCCACGGTG CTAGTCTGCG TTGTGCTGCT GCTATTCATC ATCTGCTGGC TGCCCTTCCA GATCAGCAAC TTCCTGGATA
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 GCCTACAGCA ACAGCTGCCT CAACCCACTG GTGTACGTGA TCGTGGGCAA GCGCTTCCGA AAGAACTCTT GGGAGGTGTA
 5 CCAGGGAGTG TGCCAGAAAG GGGGCTGCAG GTCAGAACCC ATTAGATGG AGAACTCCAT GGGCACACTG CGGACCTCCA
 TCTCCGTGGA ACGCCAGATT CACAACTGC AGGACTGGGC AGGGAGCAGA CAGTGAGCAA ACGCCAGCAG GGCTGCTGTG
 AATTGTGTGA AGGATTGAGG GACAGTTGCT T -3' (FRAG. NO:2275) (SEQ ID NO:11817)
 5'-TGATCCTATC ACAACCTGAG AGTAGTTTT ACTCCATTTA CAGGTGAGGT CATTGTGGTT CAAGGACGTT AAGTAACTTC
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 10 CTGCCATCT GTATCCTCCA ATCATCTTCA GTGCTTTGCT GATAGAAGGT ACGGAAATAC GATGCCACAG ACTGTCCAGG
 AAGACAGAAA CTAGGCAGAT GGGCTGGCCA TGGTCTCCAA GCCAGACTGG AATCTCCAGG TCTGGAATGA TATCATTTTT
 CTCTTTTAAT AAATTAATC ACCCACCACA CGGCTTTGAG AGGCTCAAAG GTGACCAACT CCCTTGGGAG GGCCCCGGTT
 GATAAGGAAG GAATGTGAAT CCTCCATCA CGGAAGCTTC AAGGAGGTCA AGGGTCCAAC ACTTGAGATT GTTAGTGCTG
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 15 CTCTGTAAGA CCCAGGGGAG TCAGGTGCAC TGGAGCGCGG GCTGCAGAAA ACAGCCTGAG CTCCACCTCG GCTTCTCCTT
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 CCCTAGAGAA CATCTTTGTC CTCAGCGTCT TCTGCCTGCA CAAGAGCAGC TGACAGGTGG CAGAGATCTA CCTGGGGAAC
 20 CTGGCCGCGC CAGACCTGAT CCTGGCTGCG GGGCTGCCCT TCTGGGCCAT CACCATCTCC AACCACTTCG AACTGGCTCTT
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 GCATCGACCG CTACTGGGCC CTGGTGAAAA CCATGTCCAT GGGCGCGATG CGCGCGCTGC GCTGGGCCAA GCTCTACAGC
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 25 GCTTCTGCT GCGCCTGAGT GTCATCACCT TCTGCAGAT GCAGATCATG CAGGTGCTGC GGAACAACGA GATGCAGAAG
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 30 CTCCATGGGC AACTGCGGA CCTCCATCT CGTGAACGC CAGATTACA AACTGCAGGA CTGGGACAGG AGCAGACAT
 GAGCAAAACGC CAGCAGGGCT GCTGTGAAT TGTGTAAAGG TTGAGGGACA GTTGCTTTTC AGCATGGGCC CAGGAATGCC
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 35 GAGCTTCCCT CCCGTGTGT TCCGTCCTT GCGCCAGCAA GACAACCTAG ATCTCCAGGA GAACTGCCAT CCAAGTTTGG
 TGCAATGGCT GAGTGACAAA GTGAGTGTG GCGCTGGGT TCTTTAATCT ATCAGCTAGA ACTTTGAAGG ACAATTTCTT
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 40 5'-CTGCAGAAAA CAGCCTGAGC TCCACCTCGG CTCTCCTTGG CCTTGGCTGG TTGTCTTAA CCCCTGTCTC CTCTGGACC
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 CCTTGCAAGG GCCCACTCTT AACGGGACCT TTGCCAGAG CAAATGCCCC CAAGTGGAGT GGCTGGGCTG GCTCAACACC
 ATCCAGCCCC CTCTCCTCTG GGTGCTGTTC GTGCTGGCCA CCCTAGAGAA CATCTTTGTC CTCAGCGTCT TCTGCCTGCA
 45 CAAGAGCAGC TGCACGGTGG CAGAGATCTA CCTGGGGAAC CTGGCCGCGC CAGACCTGAT CTGGCCCTGC GGGCTGCCCT
 TCTGGGCCAT CACCATCTCC AACAACTTCG ACTGGCTCTT TGGGAGAGACG CTCTGCCGCG TGGTGAATGC CATTATCTCC
 ATGAACCTGT ACAGCAGCAT CTGTTTCTG ATGCTGGTGA GCATCGACCG CTACTGGCC CTGGTGA AAAA CCATGTCCAT
 GGGCCGATG CGCGGCGTGC GCTGGGCCAA GCTCTACAGC TTGGTGATCT GGGGGTGTAC GCTGCTCTG AGCTCACCCA
 TGTGTGTGTT CCGGACATG AAGGAGTACA GCGATGAGG CCACAACGTC ACCGCTTGTG CACTACGCTA CCCATCCCTC
 50 ATCTGGGAAG TGTTCACAA CATGCTCCTG AATGTCGTGG GCTTCTGCT GCGCCTGAGT GTCATCACCT TCTGCACGAT
 GCAGATCATG CAGGTGCTGC GGAACAACGA GATGCAGAAG TTCAAGGAGA TCCAGACGGA GAGGAGGGCC ACGGTGCTAG
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 GGCATCCTCT CCACTGGCCA GGACGAGCGC ATCATGATG TAATCACACA GATCGCTTCC TGCATGGCCT ACAGCAACAG
 CTGCTCAAC CCACTGGTGT ACGTATGCT GGGCAAGCGC TTCCGAAAGA AGTCTTGGGA GGTGTACCA GAGGTGTGCC
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 55 CAGATTTACA AACTGCAGGA CTGGGCGAGG AGCAGACAGT CAGCAAAACGC CAGCAGGGCT GCTGTGAAT TGTGTAAGGA
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 TCTCCGGTAA AACACCGGAG ACTAATTCCT GNCCTGCCCA ATTTTGCAGG GAGCATGGCT GTGAGGATGG GGTGAACTCA
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 60 ACAACTTAGA TCTCCAGGAG AACTGCCATC CAGCTTGGT GCAATGGCTG AGTGACAAG TGAGTTGTTT CCTGGGTTT
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 65 TGGGTGATAT GGACAGCAGA AGGGGGAGAC CAAGGTTCCA GCTCAACCAA TAATAATTGC ACAACCACTT GTCCCTGCCT
 CAGTCCCTC TTCTGTAA TGAAGTCGT GTGAGGTTA AAGGCAGTAA CAGGTATAAA GTACTTAGAA AAGCAAGGG
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 70 5'-AAATGATAGA CCGTCAATAA TTGTGTAAT GCTTTTAAAT ATGAATGCTT TAAGCCGGGT GCAGTGCCCT ACATCTGTAA
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 75 TCAGAAGGAC TGTGCGTGCT CGTTGCATCC TTTGCAAGTG TCCAAACCT GATCCAGCT GTGCTTAGGG GTTCTGCAA

ACCTTTTCCA GGTGTTAATT ACCTCCCACT TCATTTCCTG TTTACCAACT CAGCTTTTGG TTTAGTGTG TTTGAATTCC
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 60 ATCAGAGGGG GCTCTGTAAG ACCCAGGGGA GTCAAGTGCA GTGAGCGCG GGCATGCAGA AAACAGCCTG AGCTCCACCT
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 70 CGAGATGCAG AAGTTCAAGG AGATCCAGAG GGAGAGGAGG GCCACGGTGC TAGTCCTGGT TGTGCTGCT CTATTATCA
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 75 TTCAGATGGA GAACTCCATG GGCACACTGC GGACCTCCAT CTCCGTGGAA CGCCAGATTC ACAAACCTGCA GGACTGGGCA
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GCCAGGAAT GCCAAGGAGA CATCTATGCA CGACCTTGGG AAATGAGTTG ATGTCTCCGG TAAACACCGG GAGACTAATT
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 CTGAGTCTGC GGGAGAAGAG CGGCCCTATG CATGTGTAG ATGCCCTGAT AAAGAACATC TGTCTGTGA AAGACTCAAT
 40 GAGCTGTTAT GTTGTAAACA GGAAGCATTT CACATCCAAA CGAGAAAATC ATGTAACAT GTGTCTTTTC TGTAGAGCAT
 AATAAATGGA TGAGGTTTTT GCAAAAAAAA AAAAAAAA -3' (FRAG. NO:) (SEQ ID NO 2431)
 5'-GGTGBCBTTGBGCBTGTCCGCGC-3' (FRAG. NO:2276) (SEQ ID NO:11658)
 5'-GGTCCCGTTBBGBGTGGGCC-3' (FRAG. NO:2277) (SEQ ID NO:11659)
 5'-GCCAGCCAGCCACTCCACTTGGGGC-3' (FRAG. NO:2278) (SEQ ID NO:11660)
 45 5'-GGGTGGCCAGCACGAACAGCACCCAGAGGAAGGGGGC-3' (FRAG. NO:2279) (SEQ ID NO:11661)
 5'-GGCCAGAGAAGGGCAGCCCGCAGGCCAGGATCAGGTCTGCTGCGGCC-3' (FRAG. NO:2280) (SEQ ID NO:11662)
 5'-GGAGATAATGGCATTACACGCGGC-3' (FRAG. NO:2281) (SEQ ID NO:11663)
 5'-GGCCAGCGCAGCCCGCGCATCCGGCC-3' (FRAG. NO:2282) (SEQ ID NO:11664)
 5'-GGGTCTGACCTGCAGCCCC-3' (FRAG. NO:2283) (SEQ ID NO:11665)
 50 5'-GTCTCCTTGGCATTCTCTGGGCC-3' (FRAG. NO:2284) (SEQ ID NO:11666)
 5'-CAGTCACTCTCTCCCTGCCCC-3' (FRAG. NO:2285) (SEQ ID NO:11667)
 5'-CTTGCTGGGCGAGGACGG-3' (FRAG. NO:2286) (SEQ ID NO:11668)
 5'-GGTGBCBTTGBGCBTGTCCGCGC-3' (FRAG. NO:2287) (SEQ ID NO:11669)
 5'-GGTCCCGTTBBGBGTGGGCC-3' (FRAG. NO:2288) (SEQ ID NO:11670)
 55 5'-GCCAGCCAGCCACTCCACTTGGGGC-3' (FRAG. NO:2289) (SEQ ID NO:11671)
 5'-GGGTGGCCAGCACGAACAGCACCCAGAGGAAGGGGGC-3' (FRAG. NO:2290) (SEQ ID NO:11672)
 5'-GGCCAGAGAAGGGCAGCCCGCAGGCCAGGATCAGGTCTGCTGCGGCC-3' (FRAG. NO:2291) (SEQ ID NO:11673)
 5'-GGAGATAATGGCATTACACGCGGC-3' (FRAG. NO:2292) (SEQ ID NO:11674)
 5'-GGCCAGCGCAGCCCGCGCATCCGGCC-3' (FRAG. NO:2293) (SEQ ID NO:11675)
 60 5'-GGGTCTGACCTGCAGCCCC-3' (FRAG. NO:2294) (SEQ ID NO:11676)
 5'-GTCTCCTTGGCATTCTCTGGGCC-3' (FRAG. NO:2295) (SEQ ID NO:11677)
 5'-CAGTCACTCTCTCCCTGCCCC-3' (FRAG. NO:2296) (SEQ ID NO:11678)
 5'-CTTGCTGGGCGAGGACGG-3' (FRAG. NO:2297) (SEQ ID NO:11679)
 5'-CCGTGTTGTGCBTGGTGTCTG-3' (FRAG. NO:2298) (SEQ ID NO:11680)
 65 5'-CCCCTTTGBGBTBTGGC-3' (FRAG. NO:2299) (SEQ ID NO:11681)
 5'-GCTCCBCCBTCTCCTTTTCTCC-3' (FRAG. NO:2300) (SEQ ID NO:11682)
 5'-TTGTTTTCCGTTCTCTTG-3' (FRAG. NO:2301) (SEQ ID NO:11683)
 5'-CCGTCTGTGTT-3' (FRAG. NO:2302) (SEQ ID NO:11684)
- B2 Adrenoreceptor Kinase Nucleic Acids and Antisense Oligonucleotide Fragments**
- 70 5'-GCCGCCGCC CCAAGATGGC GGACCTGGAG CGGTGCTGG CCGACGTGAG CTACCTGATG GCCATGGAGA AGAGCAAGGC
 CACGCCGCC GCGCGGCCA GCAAGAAGAT ACTGCTGCC GAGCCAGCA TCCGAGTGT CATGAGAAG TACCTGGAGG
 ACCGGGGCGA GGTGACCTTT GAGAAGATCT TTCCAGAA GCTGGGGTAC CTGCTCTTC GAGACTTCTG CCTGAACCAC
 CTGAGGAGG CAGGCCCTT GGTGGAATC TATGAGGAGA TCAAGAAGTA CGAGAAGCTG GAGACGGAGG AGGAGCGTGT
 GGCCCGCAGC CGGGAGATCT TCGACTCATA CATCATGAAG GAGCTGCTGG CCTGCTCGCA TCCCTTCTCG AAGAGTGCCA
 75 CTGAGCATGT CCAAGGCCAC CTGGGAAGA AGCAGGTGCC TCCGATCTC TTCCAGCCAT ACATCGAAGA GATTGTCAA

	AACCTCCGAG	GGGACGTGTT	CCAGAAATTC	ATTGAGAGCG	ATAAGITTCAC	ACGGTITTTGC	CAGTGGGAAGA	ATGTGGAGCT
	CAACATCCAC	CTGACCATGA	ATGACTTCAG	CGTGCAATCGC	ATCATTTGGGC	GCGGGGGCTT	TGGCGAGGTC	TATGGGTGCC
	GGAAGGCTGA	CACAGGCAAG	ATGTACGCCA	TGAAGTGCCT	GGACAAAAAG	CGCATCAAGA	TGAAGCAGGG	GGAGACCCTG
5	GCCCTGAACG	AGCGCATCAT	GCTCTCGCTC	GTGAGCACTG	GGGACTGCCC	ATTCAITGTC	TGCATGTCAT	ACGCGTTCCT
	CACGCCAGAC	AAGCTCAGCT	TCATCCTGGA	CCTCATGAAC	GGTGGGGACC	TGCACCTACC	CCTCTCCAG	CACGGGGTCT
	TCTCAGAGGC	TGACATGCGC	TTCTATGCGG	CCGAGATCAT	CCTGGGCCTG	GAGCACATGC	ACAACCGCTT	CGTGGTCTAC
	CGGGACCTGA	AGCCAGCCAA	CATCCTTCTG	GACGAGCATG	GCCACGTGCG	GATCTCGGAC	CTGGGCCTGG	CCTGTGACTT
	CTCCAAGAAG	AAGCCCCATG	CCAGCGTGGG	CACCCACGGG	TACATGGCTC	CGGAGGTCTT	GCAGAAAGGG	GTGGCCTACG
	ACAGCAGTGC	CGACTGGTTC	TCTCTGGGGT	GCATGCTCTT	CAAGTTGCTG	CGGGGGCACA	GCCCCTTCCG	GCAGCACAAAG
10	ACCAAAGACA	AGCATGAGAT	CGACCGCATG	ACGCTGACGA	TGGCCGTGGA	GCTGCCCGAC	TCCTTCTCCC	CTGAACTACG
	CTCCCTGCTG	GAGGGGTGTC	TGCAGAGGGA	TGTCAACCGG	AGATTGGGCT	GCCTGGGCGG	AGGGGCTCAG	GAGGTGAAAG
	AGAGCCCTTT	TTTCCGCTCC	CTGGACTGGC	AGATGGTCTT	CTTGACAGAA	TACCTCTCCC	CGCTGATCCC	CCCACGAGGG
	GAGGTGAACG	CGGCCGACGC	CTTCGACATT	GGCTCCTTCG	ATGAGGAGGA	CACAAAAGGA	ATCAAGTTAC	TGGACAGTGA
	TCAGGAGCTC	TACCACAAC	TCCCTCTCAC	CATCTCGGAG	CGGTGGCAGC	AGGAGGTGGC	AGAGACTGTC	TTCGACACCA
15	TCAACGCTGA	GACAGACCGG	CTGGAGGCTC	GCAAGAAAGC	CAAGAAACAAG	CAGCTGGGCC	ATGAGGAAGA	CTACGCCCTG
	GGCAAGAGCA	GCATCATGCA	TGGCTACATG	TCCAAGTATG	GCAACCCCTT	CCTGACCCAG	TGGCAGCGCG	GCTACTTCTA
	CCTGTTCCCC	AACCGCCTCG	AGTGGCGGGG	CGAGGGCGAG	GCCCCGAGA	GCCTGCTGAC	CATGGAGGAG	ATCCAGTCGG
	TGGAGGAGAC	GCAGATCAAG	GAGCGCAAGT	GCCTGCTCCT	CAAGATCCCG	GGTGGGAAAC	AGTTCATTTT	GCAGTGCAGT
	AGCGACCTGO	AGCTGGTGCA	GTGGAAGAAG	GAGTGTGCGG	ACGCCTACCG	CGAGGCCGAG	CAGCTGGTGC	AGCGGGTGCC
20	CAAGATGAAG	AACAAGCCGC	GCTCGCCCGT	GGTGGAGCTG	AGCAAGGTGC	CGCTGGTCCA	GCGCGGCAGT	GCCAACGGCC
	TCTGACCCGC	CCACCCGCTT	CCAGGAAGCT	ACCTGGAGGA	GGTGAGTCTT	AGCGGATGAG	TAGGAGTTGT	CCACGAGGGA
	AGGTACACAG	AAGGGCTTCC	AGGCCCAGGA	AACAGCAGAG	GCACAGAAGT	GAGAATGGGT	GGGTGAGTTG	GTGGGGAAC
	TCCAGGTGCA	GAGGATGGTA	ATTTGAGCTT	TATGTGCCCA	GGGCTGGGAG	GAGGGTCTCT	TCACTTTGAA	AGCAAAAGAGA
	AGTTTGTTC	CCTAATCTGC	TTTGGGCAGA	GTGTGGTGAG	TCCTAGAGAC	CCCTCTAGGT	CTCTCCTCTC	AGTAGCCCCA
25	GAAGGCTGCG	AGAGCTGCTT	CTGGGTGCCA	AGCAGGCAGT	GACTCCATCA	GATCTAGATT	TGGGAAAGAG	ATCCCTGGTC
	AGGGCTTGCA	TCAGGGCAGT	GGCTGGCCAT	GAGGACCCCT	AGAAGTAGAC	AGATTACCGG	AGATTCTCAG	GAGGCGCAGC
	AGGAGACTAT	GGTGACAAAT	TAGATTAGAG	AAGGGGAGAG	AATGAAGGAG	CAGTTGGGGT	AAAAGAAAGT	TAGAGGCTGAC
	ATGGGTATAT	GGGTGGCGAG	TGACTCACCA	CCCCTGAGA	GGAGAACCCT	ACAAGCTCTG	ACATGCTCTG	GTTCACAGTT
	CTGTTGGGGC	TGATCCAAGA	TGGTAGCCTA	GAGGTGCACA	GAGATGGGGG	CCTTGCTTTG	CAAAAGGATG	CTGGCTGCTG
30	GCCACACGCA	TGGTAATGAG	ATTTGAGCTT	TATGTGCCCA	GGGCTGGGAG	GAGGGTCTCT	TCACTTTGAA	AGCAAAAGAGA
	GGCTCTAGAG	AGGGGCATGT	TGAGATAGGA	ATGCTGCCTT	GAGACACCTG	GCTTTCCCCA	CTCTGGGTGG	CTCTCAGCAG
	GGTGGGTTTC	CCCTGCCAGG	CAGCACTGAA	CCTCTGTGCG	CTTCCGGCTG	GGAGAGTTT	TACCGTAACT	ACATGTGGAA
	CCATCCTGAA	GGAACATCTG	GATGGGATGG	GGTACAGGGA	AGGGAGCTCG	CAAGAGTGCT	GGCCAGGAGC	CTGGGTCTAT
	GAGCTGGTTG	GGGGGTGGGG	TTGGGTGCAG	GGTACTTGAT	CCTGAGTGGG	CCTTCTGCGG	CCAGGATTTG	TTCTAGAGTA
35	GGAGGGGTGG	GATCGGGGAT	GGGGGAAGCC	TGTAACCTCG	CTGCAGTTGT	CAGGTCCCAG	GTCTGGGTGG	ACCTACTAAG
	GATTCTGGGT	CCAGTGTGGG	TCCAGGTTA	GACGTCCTAG	TCCTGAGTCC	GTGTCCACAG	TTCTGGGTGT	TGAGTCTAGG
	ACAGTGATCT	GGAGTTGACA	GTCCAATCTA	GGTCTGAGTC	CTGACCCCAA	GTTCTAGAGT	CAGGGTCAATG	GTAGTAGCCT
	AGGGTCAGAA	TCAAGGTTGG	GGTCAGTAAC	CAGGATGGGA	TCGAGGTGAT	GGTCCAAAAT	CTGGATCTGG	GGACCTGTTG
	GGGGTCTGAG	GTGAGTGTGCG	CAGTCTGGGT	ATGGGCTTGG	AGACCCAGGG	CTGTGATCTG	AGGTCTATGGT	TAGAGTCTCA
40	GGTGTGGGCG	CAAGGTTTGA	GTCTGGGGTC	CTGTTTGGAG	TCTGTGTGTA	GGTGTGGGAG	GGGTCTCAAG	TGCAGGGAGT
	CCGGGGTTAT	AGCCAGGGTC	TGAGATGAAA	GTCCCAGATG	GTGTTACAGAG	GTCTGAATCT	GTGTCTTGGT	GAGCGTCCAG
	GTTCCTGTG	ATCACGTTTG	GTGTCAGGGC	TGCGGCCCGA	CTGGGGAGCC	TGGGATCCAG	AGATGTGACC	CGAGGTGTGT
	GTCAAGAGAT	GGGTCTCGGG	TCGTCTTCGT	GCCGGGCTCC	TGTCGTGTTT	CAGGCCCGGG	CTCCCGTCCA	GCATCGAGGG
45	CCGAGGTAC	GGGACGGGTC	TGAGCCCGCG	GTGCGAGGTC	TGGTTGCGGG	TCAGATTCCG	CGCGGCTCC	CGCGGCGGCC
	GTGCGCGCCC	GGCTCGGCCC	CTGCGGGGCT	CGCTGGCGTT	GTGCGCGGCA	GGCGGGGCGG	GAGGCGGCGG	CGGCTCCGGG
	GGCGCGGGCC	GGGCGGCGGC	GGCGGCGGCG	CCCCGACTGC	AGTCCCGGCG	GGAGCGGAGC	GCGAAGCGCG	GGGCGGCGGC
	CGGAGCCGCG	GCCATGGGGC	GGCGCCGCTT	GTGAGCGGCG	GCGAGCGGAG	CCGCGGGGCG	CGAGCGGCGG	CAGGCGGGAG
	CGTCCGCGCC	CGAGGCGGAG	CGAGCCGCGG	CCGGGCGGCG	CCGAGCGCGG	AGCGAGCAGG	AGCGGCGGCG	GCGGCGGCGG
	CGGCGGGAGG	AGGCAGCGCC	GCCGCAAGA	TGGCGGACCT	GGAGGCGGTG	CTGGCCGACG	TGAGCTAACC	GATGGCCATG
50	GAGAAGAGCA	AGGCCACGCC	GGCCGCGCGC	GCCAGCAAGA	AGATACTGCT	GCCCGAGCCC	AGGTGAGGAG	AAGCT-3' (FRAG.
	NO:) (SEQ ID NO:11799)							
	5'-CCAGGAAGCT	ACCTGGAGGA	GGTGAGTCTT	AGCGGATGAG	TAGGAGTTGT	CCACGGAGGA	AGGTACACAG	AAGGGCTTCC
	AGGCCACAGGA	AACAGCAGAG	GCACAGAAGT	GAGAAATGGGT	GGGTGAGTTG	GTGGGGAAC	TCCAGGTGCA	GAGGATGGTA
	GCGAAACAAA	CTGGAGCATT	AAGGTCCAA	TGCTCAAGA	CTTGACTTGG	CAGATTAAGG	AGTTTGTCTA	CCTAATCTGC
55	TTTGGGCAGA	GTGTGGTGAG	TCCTAGAGAC	CCCTCTAGGT	CTCTCCTCTC	AGTAGCCCCA	GAAGGCTGCG	AGAGCTGCTT
	CTGGGTGCCA	AGCAGGCAGT	GACTCCATCA	GATCTAGATT	TGGGAAAAGC	ATCCCTGGTC	AGGGCTGCA	TCAGGGCAGT
	GGCTGGCCAT	GAGGACCCTG	AGAAGTAGAC	AGATTACCGG	AGATTCTCAG	GAGGCCAGAG	AGGAGACTAT	GGTGACAAAT
	TAGATTAGAG	AAGGGGAGAG	AATGAAGGAG	CAGTTGGGGT	AAAAGAAAAC	TGAGGCTGAC	ATGGGTATAT	GGGTGGCGAG
	TGACTCACCA	CCCACTGAGA	GGAGAACCCT	ACAAGCTCTG	ACATGCTCTG	GTTCCAGGTT	CTGTTGGGGC	TGATCCAAGA
60	TGTTAGCCTA	GAGGTGCACA	GAGATGGGGG	CCCTGCTTTG	CAAAAAGGATG	CTGGCTGCTG	GCCCCACGCA	TGGTAATGAG
	ATTGAGCTT	TATGTGCCCA	GGGCTGGGAG	GAGGGTCCCT	TCACTTTGAA	AGCAAAAGAGA	GGCTCTAGAG	AGGGGCATGT
	TGAGATAGGA	ATGCTGCCTT	GAGACACCTG	GCTTTCCCCA	CTCTGGGTGG	CTCTCAGCAG	GGTGGGTTTC	CCCTGCCAGG
	CAGCACTGAA	CCTCTGTGCG	CTTCCGGCTG	GGAGAGTTT	TACCGTAACT	ACATGTGGAA	CCATCCTGAA	GGAACATCTG
	GATGGGATGG	GGTACAGGGA	AGGGAGCTGC	CAAGAGTGCT	GGCCAGGGAC	CTGGGTCTAT	GAGCTGGTTG	GGGGGTGGGG
65	TTGGGTGCA	GGTACTTGAT	CCTGAGTGGG	CCTTCTGCGG	CCAGGATTGG	TTCTAGAGTA	GAGGGGTTGG	GATCCGGGAT
	GGGGGAAGCC	TGTAACCTGCG	CTGCACTTGT	CAGGTCCCAG	GTTCTGGGTG	ACCTACTAAG	GATTCTGGGT	CCAGTGTGGG
	TCCAGGTTA	GACGTCCTAG	TCCTGAGTCC	GTGTCCACAG	TTCTGGGTGT	TGAGTCTAGG	ACAGTGATCT	GGAGTTGACA
	GTCCAATCTA	GGTCTGAGTC	CTGACCCCAA	GTTAGAGTAT	CAGGCTCATG	GTAGTAGCCT	AGGGTCAGAA	TCAAGGTTGG
	GGTCAGTAAC	CAGGATGGGA	TCGAGGTCAT	GGTCCAAAAT	CTGGATCTGG	GGACCTGTTG	GGGGTCTGAG	GTGAGTGTGCG
70	CAGTCTGGGT	ATGGCGTTGG	AGACCCAGGG	CTGTGATCTG	AGGTACATGT	TAGAGTCTCA	GGTGGTGGGC	CAAGGTTTGA
	GTCTGGGGTC	CTGTTTGGAG	TCTGGTGTCA	GGTGGTGGAG	TGCGTCCAAG	GTGAGGGAGT	CCGGGGTTAT	AGGCCAGGGT
	TGAGATGAAA	GTCCCAAGATG	GTGTTACAGAG	GTCTGCAATCT	GTGTCTTGGT	GAGCGTCCAG	GTTCCTGTGT	ATCACGTTTG
	GTGTACAGGG	TGCGGCCCGA	CTGGGGAGCC	TGGGATCCAG	AGATGTGACC	CGAGGTTGTG	GTGAGAGAAT	GGGTCTCGGG
	TCGTCTTCTG	GCCGGGTGCC	TGTCTGTGTT	CAGGCCCGGG	TCTCCGTCCA	GCATCGAGGG	CCGAGGTTCAC	GGCCAGGGTC
75	TGAGCCCGCG	GTGCGAGGTC	TGGTTCGGGG	TCAGATTCCG	CGCGGCTCC	AGGGGGCGCC	GTGCGCGCCC	GGCTCGGCC

CTCGCGGGCT CGCTGGCGTT GTGCGCGGCA GCGGGGGCCG GAGCGGGCCG CGGCTCCGGG GCGCGGGGCC GGGCGGGCCG
 GCGCGCGGCG CCGCGACTGC AGTCCCGGCG GGAGCGGAGC GCGAAGCGCG GGGCCGGGCC CGGAGCGGCG GCCATGGGGC
 GCGCGCGGCT GTGAGCGGCG GCGAGCGGCG CCGCGGGGCG CGAGCAGGGC CAGGCGGGAG CGTGGCGGCC CGAGGCCGAG
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 5 GCGCCAAAGA TGGCGGACCT GGAGGCGGTG CTGGCCGACG TGAGCTACCT GATGGCCATG GAGAAGAGCA AGGCCACGCG
 GCGCGCGCGC GCCAGCAAGA AGATACTGCT GCCGAGGCC AGGTGAGGAG AAGCT-3' (FRAG. NO.:) (SEQ ID NO.:11798)
 5'-GCCCGCGCGC CCAAGATGGC GGACCTGGAG GCGGTGCTGG CCGACGTGAG CTACCTGATG GCCATGGAGA AGAGCAAGGC
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 ACCGGGGCGA GGTGACCTTT GAGAAGATCT TTTCCAGAA GCTGGGGTAC CTGCTCTTCC GAGACTTCTG CCTGAACCAC
 10 CTGGAGGAGG CCAGGCCCCTT GGTGGAATTC TATGAGGAGA TCAAGAAGTA CGAGAAGCTG GAGACGGAGG AGGAGCGTGT
 GCGCGCGAGC CGGGAGATCT TCGACTCATA CATCATGAAG GAGCTGCTGG CCTGCTCGCA TCCCTTCTCG AAGAGTGCCA
 CTGAGCATGT CCAAGGCCAC CTGGGGAAGA AGCAGGTGCC TCCGGATCTC TTCCAGCCAT ACATCGAAGA GATTGTCAA
 AACCTCCGAG GGGAGGTGTT CCAGAAATTC ATTGAGAGC ATAAATTCAC ACGGTTTTGC CAGTGGAAAG ATGTGGAGTC
 CAACATCCAC CTGACCATGA ATGACTTCAG CGTGCATCGC ATCATTGGGC GCGGGGGCTT TGGCGAGGTC TATGGGTGCC
 15 GGAAGGCTGA CACAGGCAAG ATGTACGCCA TGAAGTGCCT GGACAAAAAG CGCATCAAGA TGAAGCAGGG GGAGACCCTG
 GGCCTGAACG AGCGCATCAT GCTCTCGTC GTGAGCACTG GGGACTGCC ATTCAATTGC TGTATGTCT ACAGCTTCCA
 CACGCCAGAC AAGCTCAGCT TCATCCTGGA CCTCATGAAC GGTGGGGACC TGCATACCA CCTCTCCCAG CACGCGGTCT
 TCTCAGAGGC TGACATGCGC TTCTATGCGG CCGAGATCAT CCTGGGCTG GAGCAGATGC ACAACCGCTT CGTGTGTCTAC
 CCGGACCTGA AGCCAGCCAA CATCTTCTG GAGCAGCATG GCCACGTGCG GATCTCGGAC CTGGGCTGCT CCTGTGACTT
 20 CTCAAGAAG AAGCCCCATG CCAGCGTGGG CACCCACGGG TACATGGCTC CGGAGGTCTC GCAGAAGGGC GTGGCCTACG
 ACAGCAGTGC CGACTGGTTC TCTCTGGGT GCATGCTCTT CAAGTTGCTG CCGGGGCACA GCCCTTCCG GCAGCACAAG
 ACCAAAGACA AGCATGAGAT CGACCGCATG ACGTGACGA TGGCCGTGGA GCTGCCGAC TCCTTCTCCC CTGAACCTACG
 CTCCTGCTG GAGGGGTTC TGCAGAGGGA TGCAACCGG AGATTGGGT GCCTGGGCGG AGGGGCTCAG GAGGTGAAAG
 AGAGCCCTT TTTCCGCTCC CTGGACTGCG AGATGGTCTT CTTCGAGAAG TACCTCCCC CGCTGATCCC CCGACGAGGG
 25 GAGGTGAACG CCGCGGACGC CTTGACATT GGCTCCTTCG ATGAGGAGGA CACAAAAGGA ATCAAGTTAC TGGACAGTGA
 TCAGGAGCTC TACCGCAACT TCCCTCTCAC CATCTCGGAG CCGTGGCAGC AGGAGGTGGC AGAGACTGTC TTGACACCTA
 TCAACGCTGA GACAGACCGG CTGGAGGCTC CAAAGAAAGC AAGAACAAG CAGCTGGGCG ATGAGGAAGA TACCGCCCTG
 GGCAAGGACT GCATCATGCA TGGCTACATG TCCAAGATGG GCAACCCCTT CCTGACCCAG TGGCAGCGGC GGTACTTCTA
 CCTGTTCCCC AACCGCCTCG AGTGGCGGGG CGAGGGCGAG GCCCGCAGA GCCTGCTGAC CATGGAGGAG ATCCAGTCGG
 30 TGGAGGAGAC GCAGATCAAG GAGCGCAAGT GCCTGCTCTC CAAGATCCGC GGTGGGAAAC AGTTCAATTG CAGTGGCAT
 AGCGACCCTG AGCTGGTGCA GTGGAAGAAG GAGCTGCGCG ACGCTACCG CGAGGCCAG CAGCTGGTGC AGCGGGTGCC
 CAAGATGAAG AACAAGCCGC GCTCGCCCTG GTGGAGCTG AGCAAGGTGC CGCTGTCCA GCGCGCAGT GCCAACGGCC
 TCTGACCCGC CCACCCGCT-3' (FRAG. NO.:) (SEQ ID NO.:11797)

CCR-2 CC Chemokine Receptor Nucleic Acids and Antisense Oligonucleotide Fragments

35 5'-CTTTGTGAAG AAGGAATTGG CAACACTGAA ACCTCCAGAA CAAAGGCTGT CACTAAGGTC CCGCTGCCIT GATGGATTAT
 ACACCTGACC TCAGTGTGAC AACAGTGACC GACTACTACT ACCCTGATAT CTTCTCAAGC CCCTGTGATG CGGAACCTAT
 TCAGACAAAT GGCAAGTTGC TCCTTGCTGT CTTTATTGCG CTCTCTGTTG TATTCAGTCT TCTGGGAAAC AGCCTGTGCA
 TCCTGGTCTC TGTGTTCTG AAGAAGCTGA GGAGCATCAC AGATGTATAC CTCTTGAACC TGGCCGTGTC TGACCTGCTT
 TTTGCTTCT TCTCCCTT TCAGACCTAG TATCTGCTGG ACCAGTGGGT GTTGGGACT GTAATGTGCA AAGTGGTGTG
 40 TGGCTTTTAT TACATTGGCT TCTACAGCAG CATGTTTTTC ATCACCCTCA TGAGTGTGGA CAGGTACCTG GCTGTTGTCC
 ATGCCGTGTA TGCCCTAAAG GTGAGGACGA TCAGGATGGG CACAACGCTG TGCCTGGCAG TATGGCTAAC CGCCATTATG
 GCTACCATTC CATTGCTAGT GTTTTACCAA GTGCGCTCTG AAGATGGTGT TCTACAGTGT TATTCATTTT ACAATCAACA
 GACTTTGAAG TGGAAGATCT TCACCAACTT CAAAATGAAC ATTTTAGGCT TGTGATCCC ATTCACCATC TTTATGTTCT
 GCTACATTAA AATCTCTGAC CAGCTGAAGA GGTGTCAAAA CCACAACAAG ACCAAGGCCA TCAGGTGGT GCTCATTGTG
 45 GTCATTGCAT CTTACTTTT CTGGGTCCCA TTCAACGTGG TCTTTTCTC CACTTCTTG CACAGTATG ACATCTTGA
 TGGATGTAGC ATAAGCCAAC AGCTGACTTA TGCCACCCAT GTCACAGAAA TCATTTCTCT TACTCACTGC TGTGTGAACC
 CTGTTATCTA TGCTTTGTG GGGGAGAAAG TCAAGAAACA CCTCTCAGAA ATATTTCAGA AAAGTTGCAG CCAATCTTTC
 AACTACCTAG GAAGACAAAT GCCTAGGGAG AGCTGTGAAA AGTCATCATC CTGCCAGCAG CACTCTCTCC GTTCTCCAG
 CGTAGACTAC ATTTGTGAG GATCAATGAA GACTAAATAT AAAAAACATT TTCTTGAATG GCATGTGATG AGCAGTGAGC
 50 AAAGGTGTGG GTGTGAAAGG TTTCCAAAAA AAGTTCAGCA TGAAGGATGC CGTGTGTGTT GTTGCCAACA CTTGGAACAC
 AATGACTGGA GACATAGTTG TGATGCTG GCACAACATC AAGCCTGTGA TGTGTTTAT TGATGATGTT GAACAAGTGG
 TGGCTTTGAG GGATTCTGTA TGCCAAGTGG AAAAAAAGA TGCTCCGGA ATTCGACAGG TTATCA-3' (FRAG. NO.:) (SEQ ID
 NO.:11831)

CCR-4 CC Chemokine Receptor Nucleic Acids and Antisense Oligonucleotide Fragments

55 5'-TTTCATCTCT CCGGGCTTAT TTGCTGGTTT CTCCGAATGC GGGCCTTGTC TGGTTCACGC TGGATCCCCA ACGCCTAGAA
 CAGTGCGTGG CACGCAGTTC GTCTTCTAT AAATATCGGA CTAATATGCAT CTCTGTGATG GTAATACCA CACGCTGTTG
 TGAGAATGAA TGAGTGATTG TGTGCAAGTT CTAAGTATG TGTACAAAA AGTACTGGTC GCTAAATTAC TCTTATAATA
 AAGCATACTT TTAGGATAAT AAAGCACTAT TCGCGAATTG GTTACCGCTA TTATGAAATT ACTGAGCAAT ACATATCTAC
 ATCTGATCAG TCTCCAGAAT TATGCCAAAT CCTACCTTCT TCTGAAAAGTA TCTCTAATT ATCTGCACCT GACCTAGTG
 60 ATGCTGTGAA TGTGCAAGTA TAGCTACATC CTCGGAAGGA AGGATCTTTA CTCTTTTAC CTCTGAAATG GGCTGCTCT
 GCTGAAAGCG CCGGGGAATG GCGGTTTGA AGCTTGGCCC TACTTCCAGC ATTGCGGCTT ACTGGTGGG TTACTCCAGC
 AAGTCACTCC CTTTCCCTGG GCCTCAGTGT CTCTACTGTA GCATTTCCAG GTCTGGAATT CCATCCACT TAGCAAGGAT
 GGACGCGCCA CAGAGAGACG GTTCTCTAGC CCGCGCTTCC CACTGTCTT CAGGCGCATC CCGCTTCCCT CAAACTTAGG
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 65 GCGCGCACC TCTCGCCCC GCGCTCGGAG CGTGTGTTTA TAAAGTCCG GCGCGGGCCA GAAACTTCAG TTTGTTGGCT
 GCGCGACGAG GTAGCAAAAGT GACGCCGAGG GCTGAGTGTG TCCAGTAGCC ACCGCATCTG GAGAACCAGG TATACCATG
 GAGGGGATCA GTGTAAGTCC AGTTTCAACC TGCTTTGTCA TAAATGTACA AACGTTTGAA CTTAGAGCGC AGCCCTCTC
 CGAGCGGGCA GAAGCGGCCA GGACATTGGA GGTACCCGTA CTCGAAAAAA GGGTCACCGA AAGGAGTTT CTTGACCATG
 70 CCTATATAGT GCGGGTGGGT GGGGGGGGAG CAGGATTGGA ATCTTTTCT CTGTGAGTCG AGGAGAAACG ACTGGAAAGA
 GCGTTCCAGT GGTGTCATGT GTCTCCCTT TGAATCCGC GCGCGCGGCG GGTGTGACG CTGTTTGCAG ACTGTTGCAA ACGTAAGAAC
 ATTCTGTGCA CAAGTGCAGA GAAGGCGTGC GCGTGCCTC GGGACTCAGA CCACCGGTCT CTTCTTGGG GAAGCGGGGA
 TGCTTTGAG CAGATTACAT TGCTGAATT TAGAGGCGGA GGGCGGCGTG CCTGGGCTGA CTTCCAGGA GGAGATTGCG
 CCGCTTTAA CTTGGGGT AAGCGCCTG TGAAGTCTG TGCACTGGG TGCGTGTG TAAACTCTG TGCGCGGAC

5 GGAGCTGTGC CAGTCTCCCA GCACAGTAGG CAGAGGGCGG GAGAGGGCGG TGGACCCACC GCGCCGATCC TCTGAGGGGA
 TCGAGTGGTG GCACGAGCTA GGAGTTGATC CGCCCGCGCG CTITGGGTTT GAGGGGGAAA CCTTCCCGCC GTCCGAAGCG
 CGCCTCTTCC CCACGCGCCG GAGTTGGTCC TGCAGTTTCA GAGTTTGGGG TCGTGCAGAG GTACGCGGAG TGGTTTGACC
 TCCCTTTTGA CACCGCGCAG CTGCCAGCCC TGAGATTGCG GCTCCGGGGA TAGGAGCGGG TACGGGTGTA GGGCGGGGG
 CGGTAAAGAC CGCACCTGGG CTGCCAGGTC GCCGCGCGCA AGACTGGCAG GTGCAAGTGG GGAACCGT TGGCTCTCTC
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 GGACGACCCG GCGCCCGCGG TGCCACCCGC CTGGAGGCTT CCAGCTGCCC ACCTCCGGCC GGGTTAACTG GATCAGTGGC
 10 GGGGTAATGG GAAGCCACCC GGGAGAGTGA GGAATGAAA CTGGGGCGA GGACCACGGG TGCAGACCCC GTTAACCTCT
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 GGGCTTCGT TTTAAGACCG CATCTCTTT ACCCACTACA AGTTGCTTGA AGCCAGAAAT GGTITGTATT TAGGCAGGCG
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 15 CCTCTTCCCT CCTGGGCGA AAAACTTCTT AAAAAAGTT AATCACTGCC CCTCTAGCA GCACCCACCC CACCCCCAC
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 25 GTCAACCTCT ACAGCAGTGT CCTCATCTG GCCTTCATCA GTCTGGACCG CTACCTGGCC ATCGTCCACG CCACCAACAG
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 30 GTTGGCTGCC TACTACATT GGGATCAGCA TCGACTCCTT CATCTCTCTG GAAATCATCA AGCAAGGGTG TGAGTTTGA
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 45 AGAAAGGTA TCGAGTCGTG TTTGGAATTT ACTCCACCAT C-3' (FATG. NO:) (SEQ ID NO:11832)

CD-34 Nucleic Acids and Antisense Oligonucleotide Fragments

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 65 TGCTCAACA TGGCAATGAG GCCACAACAA ACATCACAGA AACGACAGTC AAATTCACAT CTACCTCTGT GATAACCTCA
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 5 CCCCAGGGG AAAGATGAGC TTTTCTAGGC TACAATTTTC TCCCAGGAAG CTTTGATTTT TACCGTTTCT TCCTGTATT
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 GAGCTCCATG TGCCCTCTCT ACCATTGCA GAGTCTGCA CAGTTTTCTG GCTGGAGCCT AGAACAGGCC TCCCAAGTTT
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 10 AGTAGGCAGG ACCATGGGAC CAGGTCTTGG AGCTGAGCCT CTCACCTGTA CTCTCCGAA AAATCTCTT CCTCTGAGGC
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 CCCAACAGA TGCTTTCTG TCTCTGCCTC CCTCACCTG AGCCCTTCC TTGCTCTGCA CCCCATATG GTCATAGCCC
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 AGGGGTGAG CAGGATCCT GGTITCAATG ACGGTGGAA ATAGAAATTT CCAGAGAAGA GAGTATGGG TAGATATTTT
 15 TTCTGAATAC AAAGTGATGT GTTAAATAC TGCAATTAAG GTGATACTGA AACAC-3' (FRAG.No:) (SEQ ID NO:11835)
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 20 TCCTTTTGCA AGATTGTAT TGGCTTACAA CTTAAAAATC AAGGAAATC ACAAGGAAAG AAAAGTGGG AAAAAATCGG
 AGGAAACTTG CCCCTGCCCT GGCCACCGCA AAGCTGGCA CAAAGGGGT AAAAGTTAAG TGGAAAGTGA GCTTGAAGAA
 GTGGGATGGG GCCTCTCCAG GAAAGCTGAA CGAGGCATCT GGAGCCGAA CAAACCTCCA CTTTTTGG CCTCGACGGC
 GGCAACCCAG CCTCCCTCT AACGCCCTCC GCCTTTGGGA CCAACAGGG GAGCTCAAGT TAGTAGCAGC CAAGGAGAGG
 CGCTGCCTTG CCAAGACTAA AAAGGAGGAG GAGAAAGAG AGAATCCCTC ACCCTCTCC CGGGCGGAGG
 25 GGGCGGGAAG AGCGCTCCT GGCCAAGCCG AGTAGTGTCT TCCACTCGGT GCGTCTCTCT AGGAGCCCGC CGGGAAGGAT
 GCTGTCCGC AGGGGCGCGC GCGCAGGGCC CAGGATGCCG CGGGGCTGA CCGCGCTTG CTGCTGAGT TTGCTGC-3' (FRAG.
 NO:) (SEQ ID NO:11833)
 5'-CCTTTTGG CCTCGACGGC GGCAACCCAG CCTCCCTCT AACGCCCTCC GCCTTTGGGA CCAACAGGG GAGCTCAAGT
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 30 ACCCTCTCC CGGGCGGAGG GGGCGGGAAG AGCGCTCTCT GGCCAAGCCG AGTAGTGTCT TCCACTCGGT CGCTCTCTCT
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 35 TGTCTCAACA TGGCAATGAG GCCACAACA ACATCAGAGA AACGACAGTC AAATTCACAT CTACCTCTGT GATAACCTCA
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 AACTCCAGAG ACAACCTTGA AGCCTAGCCT GTCACCTGGA AATGTTTCAG ACCTTCAAC CACTAGCACT AGCCTTGCAA
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 40 GGGCTGGCC CGAGTGTCT GTGGGAGGA GCAGGCTGAT GCTGATGCT GGGCCAGGT ATGCTCCCTG CTCTTGCCC
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 AAGCACAAT CTGACCTGAA AAAGCTGGG ATCCTAGATT TCACTGAGCA AGATGTTGCA AGCCACAGA GCTATTTCCA
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 45 GGACTGGGA CCTCCCTGA GGCTCAGGA AAGGCCAGT TGAACCGAG GGCTCAGAAA AACCGGACC GCCAGGCCAC
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 50 CACATTCGGC TCCTGGAGC CAGACTCTGG TCTCTTTGG GTAAACGTTG GACGGGGGAA AGCCAAAGCT TGGAGAAGCT
 CCCAGGAACA ATCGATGGCC TTGCAGCACT CACACAGGAC CCCCTTCCCC TACCCCTCC TCTCTGCCG AATACAGGAA
 CCCCAGGGG AAAGATGAGC TTTTCTAGGC TACAATTTTC TCCCAGGAAG CTTTGATTTT TACCGTTTCT TCCTGTATT
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 55 GAGCTCCATG TGCCCTCTCT ACCATTGCA GAGTCTGCA CAGTTTTCTG GCTGGAGCCT AGAACAGGCC TCCCAAGTTT
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 60 AGGGGTGAG CAGGATCCT GGTITCAATG ACGGTGGAA ATAGAAATTT CCAGAGAAGA GAGTATGGG TAGATATTTT
 TTCTGAATAC AAAGTGATGT GTTAAATAC TGCAATTAAG GTGATACTGA AACAC-3' (FRAG. No:) (SEQ ID NO:11834)

Eotaxin Antisense Nucleic Acids and Oligonucleotide Fragments

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 65 GCTCGCTGGG CCAGCTTCTG TCCCAACCAC CTGCTGCTTT AACCTGGCCA ATAGGAAGAT ACCCTTCAG CGACTAGAGA
 GCTACAGGAG AATCACCAGT GGCAATGTG CCCAGAAAGC TGTGATCTTC AAGACCAAAC TGGCCAAAGGA TATCTGTGCC
 GACCCCAAGA AGAAGTGGT GCAGGATTCC ATGAAGTAT TGGACCAAAA ATCTCCAAT CCAAAGCCAT AAATAATCAC
 CATTTTTGA ACCAAACCAG AGCTGAGTG TTGCTCAATT TGTTTCCCT TCTTACAATG CATTCTGAGG TAACCTCATT
 ATCAGTCCAA AGGGCATGGG TTTTATTATA TATATATATA TTTTTTTT AAAAAAAAAC GTATTGCATT TAATTTATTG
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 70 CCCCATTG ATCCCTGTC ACGTGTGGG AATGTTCCCT CTCTCTCTC TTCTCTCTG GAATCTTGA AAGTCTCTG
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 AGAATCACA GTGCCAAATG TCCCAGAAA GCTGTGATCT TCAAGACCAA ACTGGCCAAG GATATCTGTG CAGACCCAA
 75 GAAGAAGTGG GTGCAGGATT CCATGAAGTA TCTGACCAA AAATCTCAA CTCCAAGCC ATAA CCACATATTC

	CCCTCCTTTT	CCAAGGCAAG	ATCCAGATGG	ATTAATAAAT	GTACCAAGTC	CCTCCTACTA	GCTTGCCTCT	CTTCTGTTCT
	GCTTGACTTC	CTAGGATCTG	GAATCTGGTC	AGCAATCAGG	AATCCCTTCA	TCGTGACCCC	CGCATGGGCA	AAGGCTTCCC
	TGGAATCTCC	CACACTGTCT	GCTCCCTATA	AAAGGCAGGC	AGATGGGCCA	GAGGAGCAGA	GAGGCTGAGA	CCAAACCCAGA
5	AACCAACCACC	TCTCACGCCA	AAGCTCACAC	CTTCAGCCTC	CAACATGAAG	GTCTCCGCAG	CACCTTCTGTG	GCTGCTGCTC
	ATAGCAGCTG	CCTTCAGCCC	CCAGGGGGCTC	GCTGGGGCCAG	GTAAGCCCCC	CAACTCCTTA	CAGGAAAGGT	AAGGTAACCA
	CCTCCAGGCT	ACTAGGTCAG	CAAGAATCTT	TACAGACTCA	CTGCAAAATC	TCCATTGAA	AAATAGGGAA	ACAGGTTTTG
	TGGGTGGACA	AGAAATGCCT	CAACCGTCAC	ATCCAGTCAC	TGGAAGAGCC	AGAACTAGAA	AGCTCCCGAG	TCTTTTCCCC
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10	GGACAGCTTT	CAGAGACAGT	GGCTAAGAGA	AGAACGAGGT	CCCAGGGGAT	CTCTTGAGGT	GACTTATTTT	GACACTCTTT
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	GGGG-3' (FRAG.NO.:)	(SEQ ID NO:11863)						
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40	GACCCCAAGA	AGAAGTGGGT	GCAGGATTCC	ATGAAGTATC	TGGACCAAAA	ATCTCCAAC	CCAAAGCCAT	AAATAATCAC
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	AGGCTTTAAA	ACTTATCCTC	CATGAATATC	AGTTATTTTT	AAACTGTAAA	GCTTTGTGCA	GATTCTTTAC	CCCCGGGAG
	CCCCAATTCG	ATCCCTGTG	ACGTGTGGGC	AATGTTCCCC	CTCTCCTCTC	TTCTCCCTG	GAATCTGTGA	AAGGTCTTGG
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45	5'-ATGAAGGTCT	CCGAGCACT	TCTGTGGCTG	CTGCTCATAG	CAGCTGCCTT	CAGCCCCCAG	GGGCTCGCTG	GGCCAGCTTC
	TGTCCTCAACC	ACCTGCTGCT	TAACTCTGG	CAATAGGAAG	ATACCCCTTC	AGCGACTAGA	GAGCTACAGG	AGAATCACCA
	GTGGCAAAATG	TCCCAAGAAA	GCTGTGATCT	TCAAGACCAA	ACTGGCCAAAG	GATATCTGTG	CCGACCCCAA	GAAGAAGTGG
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 c g c a t t t c c c a g t a c t c c a c a a c a t g c t g t c c a c a t c t g t t c t g g t t t a c a g a a a t a c c a a c a g a g a g c g t g a a g
 a a g t c a c c a c c t t t t t g a t t a t g a t t a c g g t g c t c c c t g t c a t a a a t t g a c g t g a a g c a a a t t g g g g c c a a c t c c t g
 c c t c g c t c a c t c g t g g t g t t c a t c t t g g t t t t g g g c a a c a t g c t g t c g t c c t c a t c t a a t a a a c t g c a a a a
 35 g c t g a a g t g c t t g a c t g a c a t t t a c c t g c t c a a c c t g g c c a t c t g a t c t g c t t t t c t t a t a c t c t c c c a t t g t g g g
 c t c a c t c t g c t g c a a a t g a g t g g g t c t t g g g a a t g c a a t g t g c a a a t t a t c a c a g g g c t g a t c a c a t c g g t t a t t t t
 g g c g a a t c t t c t c a t c a c t c c t c g a c a a t c g a t a g a t a c c t g g c t a t t g t c c a t g c t g t g t t g c t t a a a a g c c a g
 g a c g g t c a c c t t t g g g t g g t g a c a a g t g t g a t c a c c t g g t t g g t g g c t g t g t t g c t t c t g t c c c a g g a a t c a t c t t a
 c t a a a t g c a g a a a g a a g a t t c t g t t a t g t c t g g c c c t a t t t t c c a g a g g a t g g a a a a t t t c c a c a c a a a a a t g
 40 a g g a a c a t t t t g g g g c t g t c c t g c c g t g c t c a t a g g t c a t c t g c a c t c g g a a t c c t g a a a c c c t g c t c g g t g
 t c g a a a c a g a a g a g a g g c a t a g g g c a g t g a g a g t c a t c t c a c c a t c a t g a t t g t t a c t t t c t c t c t g g a c t c c c t
 a t a a c a t g t c a t t c c t g a c a c c t t c c a g g a a t t c t t c g g c c t g a g t a a c t g t g a a a g c a c c a g t c a a c t g g a c c a a
 g c c a c g a g g t c g g a c a g a c t c t t g g g a t g a c t c a t g c t g c a t c a a c c a t c a t c a t a t g c c t c g t t g g g g a g a a g t
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 c a g t g g a t g g a g t g a c t t c a a c a a a c a c g c c t c c a c t g g g a g c a g g a a g t c t c g g c t g g t t a t a a a a c a g g a g c a g
 t t g a t g t t g t t t a t a a a g g g a g a t a a c a a c t g t a t a a c a a a a a c t t c a a g g g t t g t t g a a c a a t a g a a a c t g
 t a a a g c a g g t g c c c a g g a a c c t c a g g g c t g t g t a c t a a c a g a c t a t g t c a c c c a a t g c a t a c c a a c a t g t g t c a
 g g g a t a a t c c a g a a a a c t g t g g g a g a g a c t t g a c t c t c c a g a a g c t c a t c c a g t c c t g a a a a t g c c t a t t a
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 c c a g t g g a g t g a a g a g a a t g t g a c a g g c a c a g a t g a a t g g g a g t g a g g a t a g t g g g g t c a g g g c t g a g a g g a
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t c a g g c a c c a a t t t a t t c c t c g t t g c t g c t c a t g a a c t t g g c c a c t c c c t g g g g c t c t t t c a c t c a g c c a c a c t g a a g c
 t t t g a t g t a c c c a c t c t a c a a c t c a t t c a c a g a g c t c g c c c a g t t c c g c c t t c g c a a g a t g a t g t g a a t g g c a t t c a g t
 c t c t c t a c g g a c c t c c c c t g c c t c t a c t g a g g a c c c c t g g t g c c c a c a a a t c t g t t c c t c g g g a t c t g a g a t g g c c a
 g c c a a g t g t a t c c t g c t t t g t c c t c g a t g c c a t c a g c a c t c t g a g g g g a g a a t a t c t g t t c t t a a a g a c a g a t a t t t
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 a t g c t g c a t a t g a a g t t a a c a g c a g g a c a c c g t t t t a t t t t a a a g g a a t g a g t t c t g g g c c a t c a g a g g a a t g a g
 g t a c a a g c a g g t t a t c c a a g a g g c a t c c a t a c c c t g g g t t t c c t c c a a c c a t a a g g a a a t t g a t g c a g c t g t t c t g a
 c a a g g a a a g a a a a c a t a c t t c t t g c a g c g g a c a a a t a c t g g a g a t t g a t g a a a t a g c c a g t c c a t g g a g c a a g
 g c t c c c t a g a c t a a t a g c t g a t g a c t t t c c a g g a g t t g a g c c t a a g g t t g a t g c t g a t t a c a g g c a t t t g g a t t t t c
 10 t a c t t c t c a g t g g a t c a t c a c a g t t t g a g t t t g a c c c a a t g c c a g g a t g g t g a c a c a c a t a t t a a a g a g t a a c a g c t g
 g t t a c a t t t g c a g c g a a t a g g g g a a g a c a g a t a t g g g t g t t t t a a t a a a t c t a a a t a t t c a t c t a a t g t a t t a
 t g a g c c a a a t g g g t a a t t t t c t g c a t g t t c t g t g a c t g a a g a g a t g a g c c t t g c a g a t a t c t g c a t g t g c a t g a a
 g a a t g t t t c t g g a a t t c t c a c t t g c t t t g a a t t g c a c t g a a c a g a a t t a a g a a a t a c t c a t g t g c a a t a g g t g a g a
 a t g t a t t t t c a t a g a t g t t a t t a c t t c c t c a a t a a a a g t t t t a t t t t g g c c t g t t c c t t (SEQ ID NO: 12111)
 15 c t g a g g t g g g t a a g a g t a c a a t g g c t a a a t c t t a a c a c a c t c t t a c g t g t a c a c c c t a c c g t a c a c c a t c c a g a c t c g t c
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 c g c a g c a c t g c t c c a a t c a t c c t t t g g a a t t t a t t c c c t g a c t g t t a a a g t t t t a g t g c t a a a t a t t c t c t
 a t t g a g g t a a g a g a c a g a t t c t g t g c a a t g g g a c a a t a g g t c a a g a g g g a a g a g c t g a g g t g a t a g g c a g a t a g a t t
 c c a g a g g c a a a c t t t t c c a t c t g c t a a g t t g a a a g a g t a a c c a c a t c c t a c c a c g t a g a c a a t c t a g g a t g t a g
 20 g g a a g t t t g t c t c t g g a a t c t a t c c a g g t a c c a g t t g g g a c t g a g c t c a g c t t a g a t g t c t g a a g a t g t t a a g t a t
 a g a a t c a g g t t a a g t c t g a a g a t g t t a a g t a t a g a a t c a g g a t c t g a g c c g g t a c a a c a c g t g g a t a a c a a t g a a g t
 c g a t g t a c a a a t t t t t t t g t c a c t t g t a a a t c t c t g t a t c a c a t t t c t c t a g g g a g c t g g a t t c c g t t t a g g a g c a
 c t a t t t c a c c a g g a a a g g a t t t t a t t a a c t t t c a a c a t t t a c t t t a a a a c t t t t t a t c t a a t g a a t a t a a
 g g a a g a t t a t a a t g a a a c c a a g t t a t c a g g c t t a a g a a a t a t a t t t a a g t t c t c c t t c t t t a g t t g c t t g a t
 25 a t t t c t t t a a g g g c t a t t t t g t a g a t a g g t g g a c g t a g a g g c t a t t t a t c a t t t t g a a g t a c a t a c t c t g a a t t
 g c t t g a g t a g t g g a c t a g a t g c t a a t g a t c c a t t g t c g t c t g a a a a g t c a t g c t t t t g t t g c a t g t t t t a g a g a t
 a g t c a a g g g a t g a t a t c a a c t a t g a g t c a c t c a t a g g a t t c a t a t t c a c a g a c c c g g a c t a a g g g c t a t a a a g a g g a
 a c a g t t c a g g a a c t a g g c t a g a a a g g a c a g a t a a c t g a a t g a t c c g t t a g a a g t t a c a a t g a a g t t c t c t a a
 t a c t g c t c c g a g g c a g c c t g c t c t g g a g c t t c c c c t g a a c a g c t c a a a g c c t g a a a a a a a a a t a a t g t g c t a t t g
 30 g g t g a g a g a (SEQ ID NO: 12112)
 c g c c c g g c a g g t c c t c t g c c t a g c a c t g c t c c c c a a g g c t c c c a g a a a t c t c a g g t c a g a g g c a g g a c a g c c t c t g g
 a g c t c t c g t c t g g t g g g a c c a t g a a c t g c a g c a g c t g t g g c t g g g c t t c c t a c t c c c a t g a c a g t c t c a g g c g g g t c
 c t g g g g c t c a g a g a t g g c g c c g t g g a c t a c c t g t c a c a a t a t g g g t a c c t a c a g a a g c c t c t a g a a g g a t c t a a t a a
 c t t c a a g c c a a g a a t a c a c c a g g c t c t g a g a c t t t c a g g a a g c a t c t g a a c t c c a g t c t c a g g t c a g c t g g a t g
 35 a t g c c a c a a g g g c c c g c a t g a g g c a g c c t c g t t g t g g c c t a g a g g a t c c c t t c a a c c a g a a g a c c c t a a a t a c c t g t t g
 c t g g g c g c t g g a a a g a a g a c c c t g a c t t t c c g c a t c t t g a a c c t g c c c t c a c c c c t c c a c c c a c a c a g c c g g g c
 a g c c c t g c t c a a g c c t t c a g g a c t g g a c a a t g t g g c t c c c t g a c c t t c a a g a g g t g c a g g c t g g t g c g g t g a c a
 t c c g c c t c t c c t c c a t g g c c g c a a a g c t c g t a c t g t t c a a t a c t t t t g a t g g g c c t g g g a g a g t c c t g g c c a t g c c
 g a c a t c c c a g a g t c g g g a g t g t g a c t t c g a c a a g a c a g a t t c t g g a c t g a g g g a c c t a c c g t g g g t g a a c c t g c g
 40 c a t a t t c a g c c c a t g a a g t g g g c c a t g c t c t g g g c t t g g g c a c t c c c g a t a t t c c a g g c c c a t g c a g c c c a g t
 a c a g g g c t a c c g g c c c a c t t a a g c t g c a c c a g a t g a t g t g g c a g g a t c c a g g c t c t c a t g g c a a g a g a t c c a
 g t g a t a a g g a t g a g a a g a a g a g a c a g a g a g c t g c c c a c t g t g c c c c a g t g c c c a c a g a a c c a g t c c c a t g c c a g a
 c c c t t g c a g t a g t a a c t g g a t g c c a t g a t g c t g g g c c c c g t g g g a a g a c c a t g c t t t c a a g g g g a c t a t g t g t g g a
 c t g t a t c a g a t t c a g g a c c g g g c c c t t g t t c e g a g t g t c t g c c t t t g g g a g g g c t c c c g g a a a c c t g g a t g c t g t
 45 g t c t a c t c g c t c g a a c a c a a t g g a t t c a c t t c t t a a g g g a g a c a a g g t g t g g c g t a c a t t a a t t c a a g a t g t c t c c
 t g g t t c c c a a g a a g t g a a t a g g t c a g a a c c t a a c c t g g a t g c a g c t c t c t a t t g g c c t c t c a c c a a a a g g t g t t c c
 t c t t a a g g g c t c c g g g t a c t g g c a g t g g g a c a g a c t a g c c g a a c t g a c t t c a g c a g c t a c c c a a a c c a a t c a a g g t
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 50 c c c g g a c t a t a g a c a t c c c c a t c a g g t g g g a a t a c c a c t c c c t a g g t a c g g g c a a a c c t t g g a t a c c a c t c t c t c a
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 c t g t a g a g g c a a g a c c g t a g a t c t c a g g c c t c t a a c a c t t c c a a c t c a g c c a c c a c t t t c t g t g c a t t t t c a c t c
 c t g a a g a g t g c t c c c c a a g c t c a g a t c c c c t a a c t a g a t t t g g c c c c a a c t c c a t t t c t g t c t g t c t t a g a c a g c c
 55 t t c c a a c t g t g t c a t c t c t c t g g a g g t c a a t g g t g g a g g a g a t g c c t g g g t c c t g t c t t c c t a c a t a a a t g c a a
 g a a a c a g c a t g g c a g t a a a c t g a g c a a g g g c c t t g g a a t c c t g a g a a t c a c a t t a t g t g c t t a t g a t a c g g g c a a
 g c t a a c c t t g t t g a a t c t c a g a t t c c c a t t t g c a a c a t a g g t a a g a c c a g t a c t g c a g g a t t g t g c a c t a a a
 t g a a a t a c t g a t g t g a a g t c c t g g c a c a g t g t c t g t a c a t t t g t g t t a a t a a a a g c t a a c c c a t g t t c a t a a g a a
 a a a a a a a g g a g a c c g g c c g a t g g a c c c a g g a c a g t g g c c a c c a t g c g t a a g c c c g t g c t c c c t g c t g a c g t g c t
 60 g g g g t g g c g g g g t g g t c a g g c g g c t g c c g g t a c g c t c t g a g c g g c a g c g t g t g g a a g a g c g a a c c c t g a c a t g g a
 g g g t a c g t t c c t c c c c a g a g c t c c a g c t g a g c c a g a g a c c g t g c g g g t c c t c a t g a g c a t g c c c t g a t g g c c t g g
 g g c a t g g a g t c a g g c c t c a c a t t c a t g a g g t g g a t t c c c c c a g g g c a g g a g c c c a c a t c c t c a t c a c t t t g c c c g
 c g c c t t c a c c a g g a c a g c t a c c c c t c g a c g g g t t g g g g g c a c c c t a g c c c a t g c c t t c t c c c t g g g g a g c a c c c a
 t c t c c g g g g a c a c t c a c t t t g a c g a t g a g g a c c t g g a c t t t g g g t c a a a a g c c t c t c a g c a g c t g g a g c a g a g c t g
 65 g c a g g c g g c t c a c c g g t g a t g a g g a g c t g g g c t c a g c c g g g c t g g c g t g t g a a t c c c t g g g t c t g g c a g t c c t g a
 g c g c c t g a g c t g a a t a c a g a g g a a g a g g c t g g a g c a a g c c g g g t g c t g g g c c g g c a g g c t g t g t c t g a g a a t g a t
 c t t a c t c a c a t t c a g c a c t g g a a g a c g g t t g g a t t t c g t g c a t c a t t c g g g g t g t t t t c t g c a a a c c t g c t t g g a
 t t t a t g t c a c a g t c c g g a a c g g a c a g t a t t c a a t g t g g a g g t t t g g t a c a a a a g t a c g g c t a c c t c c a c c g
 70 a c t g a c c c a a a t g t c a g t g c t g c g c t c t g c a g a c c a t g c a g t c t g c c c t a g c t g c c a t g c a g c a g t t c t a t g g c a t
 t a a c a t g a c g a a a a g t g g a c a g a a c a c a a t g a c t g g a t g a a a g c c c g a t g c g g t g a c c t g a c c a g a c a a g a
 g t a g t c c a a t t t c a t a t t c g t c g a a a g c g a t a t g c a t g a c a g g a c a a a t g g a g c a c a a g c a c a t c a c t t a c a g t
 a t a a a a c a g t a a c t c c a a a a g t a g g a g a c c c t g a g a c t c g t a a a g c t a t t c g c c g t g c c t t t g a t g t g g c a g a a t g t
 a a c t c c c t g a c a t t t g a a g a a g t t c c c t a c a g t a a t t a g a a a t g g c a a a c g t g a t g t g g a t a t a a c c a t t a t t t t g
 75 c a t c t g g t t c c a t g g g g a c a g c t c c c t t g a t g a g g g a g g a t t t t g g c a c a t g c c t a c t t c c c t g g a c a g g a
 a t t g g a g g a g a t a c c c a t t t t g a c t c a g a t g a g c c a t g g a c a t a g g a a a t c c t a a t c a t g a t g g a a a t g a c t a t t t c t
 t g t a g c a g t c a t g a a c t g g g a c a t g c t c t g g a t t g a g c a t t c c a a t g a c c c a c t g c c a t c a t g g c t c a t t t t a c c
 a g t a c g t a t t c t g c t g a g a t g t t g t t t t a c a g g a c a g t g g t t t g c g a g t g a g a a c a a c a g g g t g a t g g a t
 80 g g a t a c c a a t g c a a a t a c t a c t t c t g c g g g g c t g c c t c c t a g a t c g a t g c a g t t t a t g a a a t a g c a g c g g g a a
 t t t t g t g t t c t t a a a g t g a a g g a c a c t c a t c t g t a a c c a a g a t g g t g g c t c a c a a a t a c c a t t g g a a t g g a

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t c a g a t g a a t g g g g g t g g g g g g c g c c t t a g g t a c t t a t t c c a g a t g c c t t c c a g a c a a a c c a g a a g c a a c a g a a a
a a a t c g t c t c t c c c t c c t t t g a a t g a a t a t a c c c c t t a g t g t t g g g t a t a t t c a t t t c a a g g g a g a g a g a g g t t
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5 c a g g t a a g g t g a g g g a a t a g t a a g t g g t g a g a a c t a c t c a g g a a t g a a g t g t c a g a a t a a t a a g a g g t g c t a c t g a c t
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t t a a g t t g t g g a g a g t g c a a c a g t a g c a t a g g a c c t a c c c t c t g g g c c a a g t c a a g a c a t t c t g a c a t c t t a g t a t t t
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a (S E Q I D N O : 1 2 2 0 7)
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t a a a c c a t t t g g a a t t t g a t g a t c t c a a g g t c c t g a t g a t g t g g a g c c a c c t c c t a t g g g g t a g c t g t g g c t t a a c t
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25 g g g g c a a g a g t c t c t g t a c t g c t t g g t a g a g t g g a g t a t t t g a g g t c c a a a g t t t t c t g t c t t c t a g c c c t t t g
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a g t c t g g g a t g t g t g a c a c a g a g a a a t c c a g t g a t g t t a c c g t a t g g t t t c t t g g t c c c a a c g t c t c t a g c t a
a t c t g t c c a c c t t t t g g a g t t t t c t a t t t g t t t a g a t c a g g a t t t a g t c a t a t t a a t a g g a g a a a t a t g g a a a a
t a c t t c t a c t c t a c t c c t c c t g g a g t t c c t g t t t a t t t t a t g t c c t t t c c t g g t a g a c c g t a a g a g a c t t a c g a
30 a a c a a a c a c t t a c a c a t t c t a c t a a a c t c a a t g t c c a a g t t t g t g a a c t t c t t g a a t a t t g c t t g t t c a t t c c a c c c
c a g t c a c t g a t g a a t c t c c t g t g t c t g t c a a a g c c a a t g a g c t t c t g g t t a a c t t c t c t c a t g a t g c t t a g g
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t c c c t t t g t c a a c a a a t t a c t t g a t a g a t a a t t c c a g g a a t g c c t g a t g a a g c t g a t g a c a c a a g a t a t t t g g c a g a
35 c a a c a c t t c c a g t t t a c t a c a c c t a g c a t g t g g a a c t c a a g t a a t g a g a g g t c c a t t a a t t g g a t t g a a t t g g g c t g g a
t a g g a t t g g a t t g a a t c c t g t g g g a t g g c t a g g c t a a a t t a g a a t g a a g a c t a g t t t a a c a g c a g t a t c c a a g g a t a g t
t g a c t a a t a g a t t a a t t t a c t c t c a a a g a c a g t c t t a g t a g t a a g c t g t a a t g c a t t a t a c a a c t a t t t c c a g t c
a a g a t t t a a a g t t a c t t g a a a a g g a t g t a a a g a t g t g c c t a t t g a a t g g c a a t t a g c a c a a a g t t g g g a a t g a a
a c t a a t a g t t a a a t a a c a g a a t c a c a t a a a a a g g a c t t g a a t a a t g t a g c a t c c t a c c a t g t t c c t g g a t a g a a g
40 a c t g c t a t c g t a a g a t a t t c a t t c t c c t c a g g t t a a a t t a a a c t c a a t g c a a t t c a a c a g g a t t t a a a a a a c t a g a
c a a a g t g a t t c c a a g t t a c g t g g a a a t a a a a t g t g a g g g a c c a a c a a t t t g a a a a g a a g a g a t a a a a t c t c a
t c c t t c c a g a t a c c a c a a t g t a t t a a a g c a a t a g t a a t t a a c a t a g g g c a g a a a t g a g c a a g c a a g t g a c a a a a t a
a g a c a g a t g t c a c a g g a a a c t a t a t a t t a t a g t g c t t t g c g t a t a a t g a a g a t g g t c c t t c a a a t c a g t t g g g a a a
a g a t g g g t t a t t c a a t a a a t g g t g t t g g g t a a a t t g g t t a c a t t g g t g a a a t a a a g t g a a a c t c c t a c t t t g t a t
45 c a t a t g c a a a a a t a g a t t c c a g a c a g a t g a a a t t t t a a t g t a a a a a t a a a a t t c t a a a a c t a c t a g a a a a a a a g a
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t a t g a t a a a a a a g t t a a a a t a a g c a a t c t t c t t g t t t t t t t c a c c t t c c t a g a a a a a a t a t a t a g g c a a
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50 g a a a c c t c a a c a t a a a g a t a t c t g t t t t t t t c t a a a g t t c c t c a a a g t g a g c c a a t c a c t t c t a a g c t g a a c a a
a a a c a a a a c a g a a g t g a t c t t t c c a a t a a t g a a a c a a c a t t g a c a g a g c a g c t g t a g g a t c c t t c a g g c a a a t t a
t g a a a a g g t g c c c t t t c t c a g a a c c a c a g t t a c c a t t c a g c t t t g t g a c c a g a g g t t g a c t g t a c c c t a g t c c c t a c t
a g c a c c c a c c a c a t a a c c a c t c a a g g t c c t g a a g c t g t g t g t a c t t a a t g g c a g a t g a t c t a t c c c a t t t
t g t c c t a a g g a t t t t c c a a g a t a a t a t t t c t g c a t t g t t t g c t t t a c t t c a c t c c a a a t t g a a a t c t a t t t g t g
55 g g a t a a g a c t a a a a a t g c t t a t a g g a a a t t g a t a g c a c c a a a t t c c t a t c t t a a a a a t g a a a a g g t t t c a a a t c a
a t g a c c t c a g c a c t t t a c t t a a g a a a t a g a a a a g c a g g a t a a g c t a a a g c c a a g t a a a c a g a a g a a g a a t a t a
a a g a t a a g a g c a g a a t c a a t g a a t a g a a a c a a a a g a a a a a a t c a a c c a a a c a g c t g a t c t t t a a g c a g a t c t a t a
a a a t t g a t a a a a c t c t a g c a g a t g a t c a a g t a a a a a g a g a g a c a c a a a t t a c c a g t a t t a a g a a t g a g a g a g g c
a a a t c a c t a c a g a t c c t a c a g a t a t a a a a g t a t a a g g c a t a c t t g a a t a a t t t a t g a c t a t a a a t t a g g c a c c t
60 a g a t a a a c a a a t t t c c t t g a a g a c a c a a c a c c a a a g c t c a c c t a a a a t a c t c a c a a a t g a a t a g t c t t a g a t a t
t a c a a a t t t t a g g c a g g c c a g t g g c t c a a g c c t t a a t c c a g c a c t t t g g g a g g g c t a g g a a g g c g g a t c a c a g g g t
c a g g a g t t t g a g a c c a g c c t g a c t a a c a t g g t g a a c c c t g t c t a c t a a a a g t a c a a a a t a g c c a g g c t t g g t g g t
g c g t g c c t g a a t c c c a t c t a c t c a g g a g a c t g a g g c a g g a a a t g c t t g a a c c t g g g a g g c a a a g t t g t g g t g a g c c g
a g a t c g c g c c a c t c a c c t c a g c c t g g g c a a c a g a a c a g a c t c g t c t c a t t g a a t
65 t a t a g t a a a a g t c t t c c c a c a a g c a a a c t c t a g a c c a g a t g g c t c a a t g g t a a a t t c t a c t g g a c a a t c a a c a g g
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70 c t c a g t c t t c a g c a c t t a c c a g t c a t c a c c a c a c c a g a t a c c a c a t t g g a t a a t t c a t g a a t t a c t t a g a g c a a a t g
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a a a a a t g a c a a a t g t c a a t g t t g g t g g t a a t g c t t a t t g a a t g t g t t a c a c t g t t c c a t c c t g a a g g t
a g a a a t a a t a c c t t c c t c t t t c a t t t g g t t a t g t t g t g a a c a a a t c a a a g g c t g a g a t t g a a c a c a t g c t a c t t c
75 a g g t g g a t g a c c t t a c t a c t a a g c t c a t c a a a c a g c a c t t a c a g t g a a g a c c c a g a g t c c t a c c t a a c t t t t g t c a c
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a g t g a g c t g c a g g c t t c t a g a a a g g c a a g a t g c a c a t t c c c t c c t g t g g a c a a a g c c t t t g a a t t c a g g a c t t a
g g a c c a t a t g g a t t g a a a t a t t a g a c a t t g a g c t g g a g t g g t t g g g a c a a c a c c a g t a g t g t t a t a g g c c a t g g a
a t g t c a a a a g a a c a t g g a a c c c t g t t a a a t c a t t a a a c a c a a a c t c c c c t c c t g t g t g a t g g t t t g g c t g t g
80 t c c c c a c c a a a t c t a c t a t t g a a c c c a t g t g t t g g g a g g c a c c c a g t g g g a g g t a a t t g a a t c a t g g g g g c a g g t
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 15 ctgggtgggbbtggg (SEQ ID NO:12477)
 ccbgggtgggcttgg (SEQ ID NO:12478)
 ggggtgggcttgg (SEQ ID NO:12479)
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20 **Table : Exemplary Genes and oligos**

HUMAN GENES	SEQ ID NOS. Nucleic acid (amino acid)	SEQ ID NOS. of oligos (No. of Oligonucleotide Fragments)	GENEBANK ACCESSION NOS. For the Genes
H2A histone family, member N	3285	3286-3364 (79)	AI095013
tubulin, beta polypeptide	3365	3366-3405 (40)	AI672565
ELL gene (11-19 lysine-rich leukemia gene)	3406	3407-3509 (103)	AI652901
7-dehydrocholesterol reductase	3510	3511-3592 (82)	AI652764
karyopherin alpha 2 (RAG cohort 1, importin alpha 1)	3593	3594-3680 (87)	AA489087
ADP-ribosylation factor-like 7	3681	3682-3709 (28)	AA281534
EST	3710	3711-3740 (30)	AI038433
EST	3741	3742-3808 (67)	AI122689
EST	3809	3810-3862 (53)	AI092623
ESTs	3863	3864-3936 (73)	AI095492
ESTs	3937	3938-3990 (53)	AI138216
ESTs	3991	3992-4059 (68)	AI128305
ESTs	4060	4061-4123 (63)	AI125228
ESTs	4124	4125-4181 (57)	AI041482
ESTs	4182	4183-4258 (76)	AI051839
Homo sapiens mRNA; cDNA DKFZp434A1716 (from clone DKFZp434A1716)	4259	4260-4328 (69)	AI092429
ESTs	4329	4330-4362 (33)	AI096522
ESTs	4363	4364-4421 (58)	AI122807
ESTs	4422	4423-4483 (61)	AI041212
EST	4484	4485-4544 (60)	AI125651
enolase 1, (alpha)	4545	4546-4629 (84)	AI001174
EST	4630	4631-4683 (53)	AI024215
EST	4684	4685-4729 (45)	AI034360
Homo sapiens mRNA; cDNA DKFZp564H0764 (from clone DKFZp564H0764)	4730	4731-4788 (58)	AA465687
Homo sapiens mRNA for KIAA1363 protein, partial cds potassium voltage-gated channel, shaker-related subfamily, beta member 2	4789	4790-4853 (64)	AI085559
ER-associated DNAJ; ER- associated Hsp40 co- chaperone; hDj9; ERj3	4854	4855-4920 (66)	AI654215
ESTs, Weakly similar to p38 protein [H.sapiens]	4921	4922-4948 (27)	AA505075
	4949	4950-5008 (59)	AA906703
CGI-142	5009	5010-5084 (75)	AI369870

ESTs	5085	5086-5138 (53)	AA463249
Homo sapiens clone 25058 mRNA sequence	5139	5140-5165 (26)	R38894
ESTs	5166	5167-5203 (37)	R49144
squamous cell carcinoma antigen 1	5204	5205-5290 (86)	AA398883
ESTs	5291	5292-5349 (58)	AA425700
myosin X	9 (10)	1628-2922 (1295)	NM_012334, AA187977
ESTs	5350	5351-5395 (45)	AA459692
epithelial protein lost in neoplasm beta	5396	5397-5453 (57)	AA487557
CD44 antigen (homing function and Indian blood group system)	5454	5455-5509 (55)	T69168
coagulation factor III (thromboplastin, tissue factor)	5510	5511-5588 (78)	AI313387
ESTs	5589	5590-5646 (57)	AA909635
adducin 1 (alpha)	5647	5648-5705 (58)	R00103
5' nucleotidase (CD73)	5706	5707-5767 (61)	N35316
ESTs, Moderately similar to semaphorin C [M.musculus]	5768	5769-5823 (55)	AA293300
ESTs	5824	5825-5892 (68)	AA278764
ESTs	5893	5894-5926 (33)	AA678160
calmodulin 2 (phosphorylase kinase, delta)	11 (12)	2923-3107 (185)	NM_001743, AA663941
ESTs	5927	5928-5996 (69)	R42770
high-mobility group (nonhistone chromosomal) protein 17	5997	5998-6095 (98)	H93087
chloride intracellular channel 1	6096	6097-6177 (81)	AA486518
ubiquitin carrier protein	6178	6179-6208 (30)	AA464729
transglutaminase 2 (C polypeptide, protein-glutamine-gamma-glutamyltransferase)	1 (2)	13-552 (540)	M55153, R97066
tubulin, alpha 1 (testis specific)	6209	6210-6270 (61)	AA180912
sparc/osteonectin, cwcv and kazal-like domains proteoglycan (testican)	6271	6272-6343 (72)	AA436142
proteasome (prosome, macropain) 26S subunit, non-ATPase, 2	6344	6345-6413 (69)	H05893
tubulin, beta polypeptide	6414	6415-6485 (71)	H37989
filamin B, beta (actin-binding protein-278)	6486	6487-6551 (65)	AA486238
stannocalcin	5 (6)	677-1323 (647)	NM_003155, AA085318
low density lipoprotein receptor (familial hypercholesterolemia)	6552	6553-6609 (57)	AA504461
plectin 1, intermediate filament binding protein, 500kD	6610	6611-6683 (73)	AA448400
S100 calcium-binding protein A2	3 (4)	553-676 (124)	BC002829, AA458884
immediate early response 3	6684	6685-6735 (51)	AA480815
calpain, large polypeptide L2	6736	6737-6831 (95)	AA102454
pleckstrin homology-like domain, family A, member 1	6832	6833-6900 (68)	AA258396
melanoma adhesion molecule	6901	6902-6979 (78)	AA497002
CD44 antigen (homing function and Indian blood group system)	6980	6981-7069 (89)	AA282906
programmed cell death 5	7070	7071-7159 (89)	AA156940
hexokinase 1	7160	7161-7209 (49)	AA485272
vascular endothelial growth factor	7210	7211-7290 (80)	R19956
integrin, alpha 2 (CD49B, alpha 2 subunit of VLA-2 receptor)	7291	7292-7396 (105)	AA463610
calumenin	7397	7398-7471 (74)	R78585
syntaxin 11	7472	7473-7526 (54)	R33851
diphtheria toxin receptor	7527	7528-7578 (51)	R14663

(heparin-binding epidermal
growth factor-like growth factor)
Fn14 for type I transmembrane
protein

protein	7579	7580-7632 (53)	R33355
Nef-associated factor 1	7633	7634-7694 (61)	T64626
high-mobility group (nonhistone chromosomal) protein isoforms I and Y	7695	7696-7753 (58)	AA448261
catechol-O-methyltransferase	7754	7755-7796 (42)	R44202
C-terminal binding protein 1	7797	7798-7864 (67)	W81570
collagen, type XVII, alpha 1	7865	7866-7932 (67)	AA128561
ESTs	7933	7934-8029 (96)	N58473
farnesyl-diphosphate farnesyltransferase 1	8030	8031-8107 (77)	AA679352
RNA helicase-related protein interferon stimulated gene (20kD)	8108	8109-8147 (39)	N55459
	8148	8149-8230 (82)	AA150500
steroid-5-alpha-reductase, alpha polypeptide 1 (3-oxo-5 alpha-steroid delta 4-dehydrogenase alpha 1)	8231	8232-8283 (52)	H16833
prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase)	8284	8285-8345 (61)	AA644211
laminin, alpha 3 (niclin (150kD), kalinin (165kD), BM600 (150kD), epilegrin)	8346	8347-8440 (94)	AA001432
collagen, type XVII, alpha 1	8441	8442-8494 (53)	H87536
keratin 18	8495	8496-8601 (106)	AA664179
heparan sulfate (glucosamine) 3-O-sulfotransferase 1	8602	8603-8652 (50)	H86812
tubulin, alpha 2	8653	8654-8765 (112)	AA626698
adenylyl cyclase-associated protein	8766	8767-8833 (67)	R37953
forkhead box D1	8834	8835-8897 (63)	AA069372
cathepsin C	7 (8)	1324-1627 (304)	NM_001814, AA644088
ESTs, Highly similar to AF151802_1 CGI-44 protein [H.sapiens]	8898	8899-8985 (87)	T74688
ribonucleotide reductase M2 polypeptide	8986	8987-9056 (70)	AA187351
laminin, gamma 2 (niclin (100kD), kalinin (105kD), BM600 (100kD), Herlitz junctional epidermolysis bullosa))	9057	9058-9133 (76)	AA677534
Homo sapiens mRNA; cDNA DKFZp586P1622 (from clone DKFZp586P1622)	9134	9135-9221 (87)	T59658
ESTs, Weakly similar to /prediction	9222	9223-9289 (67)	AA284245
lactate dehydrogenase A	9290	9291-9369 (79)	H05914
Total			
98 genes		9369 (9277)	

(GENBANK ACCESSION NO. M55153)

5 AACAGGCGTGACGCCAGTTCTAAACTTGAACAAAAACAAACTTCAAAGTACACCAAAATAGAACCTCCTTAAAGCATAAACTCTCA
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(SEQ ID NO: 1)
Amino acid sequence for G-protein G-alpha H (GENBANK ACCESSION No. M55153)
MetAlaGluGluLeuValLeuGluArgCysAspLeuGluLeuGluThrAsnGlyArgAspHisHisThrAlaAspLeuCysArgGluLysLeuValValArgArgGlyGlnProPheTrpLeuThrLeuHisPheGluGlyArgAsnTyrGlnAlaSerLeuValValAspSerLeuThrPheSerValValThrGlyProAlaProSerGlnGluAlaGlyThrLysAlaArgPheProLeuArgAspAlaValGluGluGlyAspTrpThrAlaThrValValAspGlnGlnAspCysThrLeuSerLeuGlnLeuThrThrProAlaAsnAlaProIleGlyLeuTyrArgLeuSerLeuGluAlaSerThrGlyTyrGlnGlySerSerPheValLeuGlyHisPheIleLeuLeuPheAsnAlaTrpCysProAlaAspAlaValTyrLeuAspSerGluGluGluArgGlnGluTyrValLeuThrGlnGlnGlyPheIleTyrGlnGlySerAlaLysPheIleLysAsnIleProTrpAsnPheGlyGlnPheGlnAspGlyIleLeuAspIleCysLeulleLeuLeuAspValAsnProLysPheLeuLysAsnAlaGlyArgAspCysSerArgSerSerProValTyrValGlyArgValGlySerGlyMetValCysCysAsnAspLysGlnGluLeuLeuGlyArgTrpAspAsnAsnTyrGlyAspGlyValSerProMetSerTrpIleGlySerValAspIleLeuArgArgTrpLysAsnHisGlyCysGlnArgValLysTyrGlnGlyCysTrpValPheAlaGluValAlaCysThrValLeuArgCysLeuGlyIleProThrArgValValThrAsnTyrAsnSerAlaHisAspGlnAsnSerAsnLeuLeulleGluTyrPheArgAsnGluPheGlyGluIleGlnGlyAspLysSerGluMetIleTrpAsnPheHisCysTrpValGluSerTrpMetThrArgProAspLeuGlnProGlyTyrGluGlyTrpGlnAlaLeuAspProThrProGlnGluLysSerGluGlyThrTyrCysCysGlyProValProValArgAlaIleLysGluGlyAspLeuSerThrLysTyrAspAlaProPheValPheAlaGluValAsnAlaAspValValAspTrpIleGlnGlnAspAspGlySerValHisLysSerIleAsnArgSerLeulleValGlyLeuLysIleSerThrLysSerValGlyArgAspGluArgGluAspIleThrHisThrTyrLysTyrProGluGlySerSerGluArgGluAlaPheThrArgAlaAsnHisLeuAsnLysLeuAlaGluLysGluGluThrGlyMetAlaMetArgIleArgValGlyGlnSerMetAsnMetGlySerAspPheAspValPheAlaHisIleThrAsnAsnThrAlaGluGluTyrValCysArgLeuLeuLeuCysAlaArgThrValSerTyrAsnGlyIleLeuGlyProGluCysGlyThrLysTyrLeuLeuAsnLeuThrLeuGluProPheSerGluLysSerValProLeuCysIleLeuTyrGluLysTyrArgAspCysLeuThrGluSerAsnLeulleLysValArgAlaLeuLeuValGluProValIleAsnSerTyrLeuLeuAlaGluArgAspLeuTyrLeuGluAsnProGluIleLysIleArgIleLeuGlyGluProLysGlnLysArgLysLeuValAlaGluValSerLeuGlnAsnProLeuProValAlaLeuGluGlyCysThrPheThrValGluGlyAlaGlyLeuThrGluGluGlnLysThrValGluIleProAspProValGluAlaGlyGluGluValLysValArgMetAspLeuValProLeuHisMetGlyLeuHisLysLeuValValAsnPheGluSerAspLysLeuLysAlaValLysGlyPheArgAsnValIleIleGlyProAla (SEQ ID NO: 2).

Amino acid sequence for S100A2 (GENBANK ACCESSION No. BC002829)
MetMetCysSerSerLeuGluGlnAlaLeuAlaValLeuValThrThrPheHisLysTyrSerCysGlnGluGlyAspLysPheLysLeuSerLysGlyGluMetLysGluLeuLeuHis
LysGluLeuProSerPheValGlyGluLysValAspGluGluGlyLeuLysLysLeuMetGlySerLeuAspGluAsnSerAspGlnGlnValAspPheGlnGluTyrAlaValPheLeu
AlaLeuLeuThrValMetCysAsnAspPhePheGlnGlyCysProAsnArgPro (SEQ ID NO: 4).

(GENBANK ACCESSION NO. NM_003155)
CAGTTTGCAAAGGCCAGAGTTGCGAAGCAAGCAGCGACTGCAGCAGCAGCAGCAGCGCGGTGGCAGCAGCAGCAGCAGCAGCGGC
GGCAGCAGCAGCAGCAGCGGAAGCACCAGTGGCAGCAGCAGCAGTACCAGCAACAACAACAAAAAATCTCATCAATCTCTC
ACCTAAGCTTTTCAGTGTATCCAGATCCACATCTTCACTCAAGCCAGGAGGAAAGAGGAAAGGGGGCAGGAAAAA
65 CCCCACAACTTAGCGGAAACTTCTCAGAGAAATGCTCCAAAACTCAGCAGTGCTTCTGTGCTGGTGATCAGTGCTTCTGCAACCCAT
GAGGCGGAGCAGAAATGACTCTGTGAGCCCCAGGAAATCCCGAGTGGCGGCTCAAACTCAGCTGAAGTGGTTCGTTGCCATCAAC
TGCTCTCAGGTGCGCTGCGGGGCTTTTGATGCTGTGAAATCTCCACCTGTGACACAGATGGGATGTATGACATCTGTAATCTCT
CTTGACAGCGCTGTAAATTGACATCTCAGGGAAGCAATTCGTCAAAGAGAGCTTAAATGCATCGCCAAACGGGGTCACTCCCA
AGGTCCTCTCGCCATTCGGAGGTGCTCCACTTCCAAAGGATGATTGCTGAGGTGCAGGAAGAGTGCTACAGCAAGCTGAATGTGT
70 GCAGCATCGCCAAAGCGGAAACCTTGAAGCCATCACTGAGGTGCTGACCTGCCCCAATCACTTCTCAACAGTACTATAACAGACTT

GTCCGAAGCCTGCTGGAATGTGATGAAGACACAGTCAGACACAATCAGAGACAGCCTGATGGAGAAAAATTGGGCCCTAACATGGCCA
 GCCTCTTCCACATCCTGCAGACAGACCACTGTGCCAAACACACCCACGAGCTGACTTCAACAGGAGACGACCAATGAGCCGAG
 AAGCTGAAAGTCTCCTCCAGGAACTCCGAGGTGAGGAGGACTCTCCCTCCACATCAAAACGCACATCCCATGAGAGTGCATAACC
 AGGGAGAGGTTATTACAACTCACCACCTAGTATCATTTAGGGGTGTGACACACCAATTTTGTAGTGTACTGTGCTGGTTTGA
 5 TTTTITTAAGTAGTTCTTATTTCTATCCCTTTAAAGAAAAATGATGAACTAGGCTTCTGTAATCAATATCCCAACATTCTGCA
 ATGGCAGCATCCCAACCAAAAATCCATGTGATCATTTGCCCTCTCCTCAGGAGAAAGTACCCTCTTTTACCAACTTCTCTGCCAT
 GTCTTTTCCCTGCTCCCTGAGACCACCCCAACACAAAACATTCTGTAACCTCCAGCCATTGTAATTTGAAGATGTGGATCC
 CTTTGAACGGTTGCCCGAGTAGAGTTAGCTGATAAGGAACTTTATTTAAATGCATGTCTTAAATGCTCATAAAGATGTTAAATGG
 AATTCGTGTTATGAATCTGTGCTGGCCATGGACGAATATGAATGTCACATTGGAATCTTGATCTCTAATGAGCTAGTGTCTTATGGT
 10 CTTGATCCTCCAATGTCTAATTTTCTTTCCGACACATTTACCAAAATGCTTGGAGCCTGGCTGTCCAACAGACTTTGAGCCTGCATCT
 TCTTGATCTAATGAAAAACAAAAGCTAACATCTTTACGTACTGTAACCTGCTCAGAGCTTTAAAAGTATCTTTAAACAATTGTCTTA
 AAACAGAGAGATCTTAAGGTCTAAGTGTGAATATAAATAGCTGAAACTAATGTACTGTACATAAATTCAGAGGAGCTCTGCTTA
 AACAAAGCAGTATATAAATCTTATGTCATATAGATTAGTTTGTAACTTAGCTTTATTTTCTTTTCTGGGAATGGAATAACTA
 TCTCACTTCCAGATATCCACATAAATGCTCTCTGTGGCTTTTATACTAAAGGGGTAGAAAGTAGTTTAAATCAACATCAAACT
 15 TAAGATGGGCTGTATGAGACAGGAAAAACCAACAGGTTTATCTGAAGGAGCCAGGTAAAGATGTTAATCTCCACGCCACCTCAA
 CCCAGAGGCTACTCTTGACTTAGACCTATACTGAAAGATCTCTGTACATCCAAGTGGAAATCCAGGAACCAAAAGAGCATCCCT
 ATGGGCTTGGACCACTTACAGTGTGATAAGGCTACTACATAGGAAGTGGTAGTTCTTTACTCGTCCCTTACATCGTGTGG
 TACTCTGGCAATGATGATGGGTGGGAGACTTTCCATTAAATCAATCAGGAATGAGTCAATCAGCCTTTAGGTCTTATGTCGGGG
 GACTTGGGGCTGAGAGAGTATAAATAACCTGGGCTGTCCAGCTTAATAGACTTCTCTTACATTTCTGCTGTAGCAGCGTGCCT
 20 OCCAAAGTAGTCTGGCAGCTGGACCATCTCTGTAGGATCGTAAAAAATAGAAAAAAGAAAAAAGAAAAAGAAAAAGAGGA
 AAAAGAGCTGGTGGTTTGTATCTTTCTGCCATGATGTTTACAAGATGGCGACCACCAAGTCAAACGACTAACCTATCTATGAACAA
 CAGTAGTTTCTCAGGGTCACTGCTTGAACCAACAGTCCCTTATGAGCGTCACTGCCACCAAAAGGTCAATGTCAAGAGAGGAA
 GAGAGGGAGGAGGGTAGGACTGCAGGGGCCACTCCAACTCGCTTAGGTAGAACTATTGGTGTCTGACTCTCACTAGGCTAAAC
 TCAAGATTTTGACCAAAATCGAGTATAGGATCCGTTGGGAGGAGAGGGGCACATCTCCAGAAAAATGAAGAAATCAAACTTT
 25 ACCATAAAGCCTTTAAACAGTAACGTGCTGCTCAAGGACCAAGAGCAATTGCAGCAGACCCAGCAGCAGCAGCAGCAGCAGCA
 ACATTGCTGCCTTTTCCACACACAGCCTCTAAGCGTGTGACATCAGATTGTTAAGGGCATTTTATACTCAGAACTGTCCCTCCC
 CAGGTCCCCAACTTATGGACACTGCTTCTGAAATCAGAAAGCTATTAAAGTTTGTGTGTTGTGTCATTGTCAAACCCAACTA
 ACTTCCCAACCCAGGCAAGGCTGACTTCTGTAATCAGAAAGCTATTAAAGTTTGTGTGTTGTGTCATTGTCAAACCCAACTA
 AGCCAGGACCCCAATGCGACAAGTAGTTCATGAGTATTCCTAGCAAATTTCTCTTTCTTCAGTTTCTAGATTTCCTTTTCTTTT
 30 CTTTTTTTTTTTTTTTTTTTTTGGCTGTGACCTCTTCAAACCGTGGTACCCCCCTTTTCTCCCCACGATGATATCTATATGTATCT
 ACAATACATATATCTACACATACAGAAAGAGCAGTTCTACATGTTGCTAGTTTGTGCTTCTCTTCCCCCACCCTACTCCCTCCA
 ATTCCCCCTTAAACTTCAAAGCTTCGTCTGTGTTTGTGCTGACAGTGATTGCGGGGCTGACCTAGACCAGTTTGCATGATTCTCT
 CTGTGATTTGGTTGCATTTAGACATTTTGTGCCATTATATTTGCATTATGATTATATAATTTAAATGATATTTAGTTTGTGGCTG
 AGTACTGGAATAAACAGTAGCATATCTGTATATGTCATTATTTATGTTAAATTACATTTTAAAGCTCCATGTGCATATAAAGGT
 35 TATGAACATATCATGTTAATGACAGATGCAAGTTATTTTATTGCTTATTTTATAATTAAAGATGCCATAGCATAATATGAAGCC
 TTTGGTGAATTCCTTCTAAGATAAAAAATAATAAAGTGTACGTTTATTGGTTTCAAAAAAAAAAAAAAAAAAAAAA
 (SEQ ID NO: 5)

Amino acid sequence for Stanniocalcin 1 (GENBANK ACCESSION No. NM_003155)

MetLeuGlnAsnSerAlaValLeuLeuValLeuValIleSerAlaSerAlaThrHisGluAlaGluGlnAsnAspSerValSerProArgLysSerA
 40 rgValAlaAlaGlnAsnSerAlaGluValValArgCysLeuAsnSerAlaLeuGlnValGlyCysGlyAlaPheAlaCysLeuGluAsnSerThrCy
 sAspThrAspGlyMetTyrAspIleCysLysSerPheLeuTyrSerAlaAlaLysPheAspThrGlnGlyLysAlaPheValLysGluSerLeuLys
 CysIleAlaAsnGlyValThrSerLysValPheLeuAlaIleArgArgCysSerThrPheGlnArgMetIleAlaGluValGlnGluCysTyrS
 erLysLeuAsnValCysSerIleAlaLysArgAsnProGluAlaIleThrGluValValGlnLeuProAsnHisPheSerAsnArgTyrTyrAsnAr
 gLeuValArgSerLeuLeuGluCysAspGluAspThrValSerThrIleArgAspSerLeuMetGluLysIleGlyProAsnMetAlaSerLeuPhe
 45 HisIleLeuGlnThrAspHisCysAlaGlnThrHisProArgAlaAspPheAsnArgArgArgThrAsnGluProGlnLysLeuLysValLeuLeuA
 rgAsnLeuArgGlyGluGluAspSerProSerHisIleLysArgThrSerHisGluSerAla (SEQ ID NO: 6).

(GENBANK ACCESSION NO. NM_001814)

AATTCTTCACTCTTTTCTCAGCTCCCTGCAGCATGGGTGCTGGGCCCTCCTGTGCTGCTGCCGCCCTCCTGCTGCTCTCTCCGGCG
 ACGGCGCGGTGCGCTGCGACACACCTGCCAACTGCACCTATCTTGACCTGCTGGGCACCTGGGTCTCCAGGTGGGCTCCAGCGGTT
 50 CCCAGCGCGATGTCAACTGCTCGGTTATGGGACCACAAGAAAAAAGTAGTGGTGTACCTTCAGAAGCTGGATACAGCATATGAT
 GACCTTGGCAATTCTGGCCATTTACCATCAITTAACAACCAAGGCTTTGAGATTGTGTTGAATGACTACAAGTGTTTGCCTTTTAA
 AGTATAAAGAAAGAGGGCAGCAAGGTGACCACTACTGCAACGAGACAATGACTGGGTGGGTGTCATGATGTGTTGGGCGGAAGT
 GGCTTGTTCACCGAAAGAGGTGGGAAGTGCCTCTGAGAATGTGTATGTCAACACAGCACACCTTAAGAATTCTCAGGAAAAAGT
 ATTCTAATAGGCTCTACAAGTATGATCACAACCTTTGTGAAGGCTATCAATGCCATTCAAGAAGTCTTGGACTGCAACTACATACATGG
 55 AATATGAGACTCTTACCCTGGGAGATATGATTAGGAGAAGTGGTGGCCACAGTCCGAAAAATCCCAAGGCCCAACCTGACCACTG
 ACTGCTGAAATACAGCAAAAGATTTTGCATTTGCCAACATCTTGGGACTGGAGAAATGTTTCATGGTATCAATTTTGTGAGTCTGTT
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 CAGACCCCAATCCTAAGCCCTCAGGAGGTTGTGCTTGTAGCCAGTATGCTCAAGGCTGTGAAGGCGGCTTCCCATACCTTATTGCA
 GQAAAGTAGCCCAAGATTGTTGGCTGGTGGAAAGAGCTTGTCTCCCTACACAGGCACTGATTCTCCATGCAAAATGAAGGAAGA
 60 CTGCTTTCGTTATTACTCTCTGAGTACCACTATGTAGGAGGTTTCTATGGAGGCTGCAATGAAGCCCTGATGAAGCTTGAGTTGGTC
 CATCATGGGCCCCATGGCAGTTGCTTTTGAAGTATATGATGACTTCTCCACTACAAAAAGGGGATCTACCACCACTGGTCTAAGA
 GACCTTTCAACCCCTTTGAGCTGACTAATCATGCTGTCTGCTGTGGGTATGGCACTGACTCAGCTCTGGGATGGATTACTGGA
 TTGTTAAAAACAGCTGGGGCACCGGCTGGGGTGAGAATGGCTACTTCCGGATCCGAGAGGAAGTGTGAGTGTGCAATTGAGAGC
 ATAGCAGTGGCAGGCCACCAATTCCTAAATTTGAGGGTATGCTTCCAGTATTTCATATGATCTGCATCAGTTGTAAGGGGAAT
 65 TGGTATATTCACAGCTGTAGACTTTCAGCAGCAATCTCAGAAGCTTCAAAATAGATTTCATGAAGATATTGTCTTCAGAATTA
 AACTGCCCTTTAATTTAATATACCTTTCAATCGGCCACTGGCCATTTTCTAAGTATTCAATTAAGTGGAAATTTCTGGAAGATG
 GTCAGCTATGAAGTAAATAGAGTTTGTCTAATCATTTGTAATTCAAACATGCTATATTTTAAAAATCAATGTGAAAAATAGAGCTTAT
 TTTTAAATTTGACCAATCACAAGAAAAATAATGGCAATAATTATCAAACTTTTAAAAATAGATGCTCATATTTTAAAAATAAAGTTT
 AAAAAATACTGC
 70 (SEQ ID NO: 7)

Amino acid sequence for Cathepsin C

(GENBANK ACCESSION No. NM_001814)

MetGlyAlaGlyProSerLeuLeuLeuAlaAlaLeuLeuLeuLeuSerGlyAspGlyAlaValArgCysAspThrProAlaAsnCysThrTyrL

euAspLeuLeuGlyThrTrpValPheGlnValGlySerSerGlySerGlnArgAspValAsnCysSerValMetGlyProGlnGluLysLysValVal
lValTyrLeuGlnLysLeuAspThrAlaTyrAspAspLeuGlyAsnSerGlyHisPheThrIleIleTyrAsnGlnGlyPheGluIleValLeuAsn
AspTyrLysTrpPheAlaPhePheLysTyrLysGluGlySerLysValThrThrTyrCysAsnGluThrMetThrGlyTrpValHisAspValL
euGlyArgAsnTrpAlaCysPheThrGlyLysLysValGlyThrAlaSerGluAsnValTyrValAsnThrAlaHisLeuLysAsnSerGlnGluLy
5 sTyrSerAsnArgLeuTyrLysTyrAspHisAsnPheValLysAlaIleAsnAlaIleGlnLysSerTrpThrAlaThrThrTyrMetGluTyrGlu
ThrLeuThrLeuGlyAspMetIleArgArgSerGlyGlyHisSerArgLysIleProArgProLysProAlaProLeuThrAlaGluIleGlnGlnL
ysIleLeuHisLeuProThrSerTrpAspTrpArgAsnValHisGlyIleAsnPheValSerProValArgAsnGlnAlaSerCysGlySerCysTy
rSerPheAlaSerMetGlyMetLeuGluAlaArgIleArgIleLeuThrAsnAsnSerGlnThrProIleLeuSerProGlnGluValValSerCys
SerGlnTyrAlaGlnGlyCysGluGlyGlyPheProTyrLeuIleAlaGlyLysTyrAlaGlnAspPheGlyLeuValGluGluAlaCysPheProT
10 yrThrGlyThrAspSerProCysLysMetLysGluAspCysPheArgTyrTyrSerSerGluTyrHisTyrValGlyGlyPheTyrGlyGlyCysAs
nGluAlaLeuMetLysLeuGluLeuValHisHisGlyProMetAlaValAlaPheGluValTyrAspAspPheLeuHisGlyLysGlyIleTyr
HisHisThrGlyLeuArgAspProPheAsnProPheGluLeuThrAsnHisAlaValLeuLeuValGlyTyrGlyThrAspSerAlaSerGlyMetA
spTyrTrpIleValLysAsnSerTrpGlyThrGlyTrpGlyGluAsnGlyTyrPheArgIleArgArgGlyThrAspGluCysAlaIleGluSerIl
eAlaValAlaAlaThrProIleProLysLeu (SEQ ID NO: 8).

15 (GENBANK ACCESSION NO. NM_012334)
GAGACAAAGGCTGCCGTCCGGACGGGCGAGTTAGGGACTTGGGTTTGGGCGAACAACAAAGGTGAGAAGGACAAGAAGGGACCGGG
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GACTTCCGCGAGTCCGAGCGGCACTCCGCGAGTCCGGGACTGCGCTGGAACAATGGATAACTTCTTCCCGAGGGGAACACGGGTCT
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20 GTATTTCACTTACAAGCAGAGCACAATTACCCACCAGAAGGTGACTGCTATGCACCCACGAACGAGGAGGGCGTGGATGACATGGC
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CATCTGGCCTCCGTGAACCCCTACCAGCCATCGCGGGCTGTACGAGCCTGCCACCATGGAGCAGTACAGCCGGCGCCACCTGG
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GTGTGTAAAGTGGGCGAGGTAAACCGAAAGCACTAAATGTACTCTCAAGTTTCTGTCAGTCATCAGTCAACAGTCTTTGGATGTGT
25 CCTTAAAGGAGAAGACATCCTGTGTGAACGAGCTATTTCTTGAAGCAGCCCCATCATGGAAGCTTTCCGCAATGCGAAGACCGTG
TACAACAACAACCTCTAGTCGCTTTGGGAAGTTTGTTCAGCTGAACATCTGTGAGAAAGGAAATATTCAGGCGGGAGAAATGTAGA
TTATTTATTAGAAAAAACCGAGTAGTAAGGCAAAATCCCGGGGAAAGGAATTATCACATATTTTATGCACTGCTGGCAGGGCTGG
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30 GCTGCTGCTGGTATCTGTCATCTTTGGGAACATAGAATTTATCACTGCTGGTGGGGACAGGTTTCTTCAAAACAGCTTTGGGCGAG
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35 GAATATAGCCGGGAAGGATAGTGTGGGAAGATATTGACTGGATAGACAATGGAGAATGCCTGGACTGATTTAGAGAAGAACTTGG
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40 GACTCACTGCATTCCTTAATGGCAACGCTAAGCTCCTCTAATCCTTTCTTTGTCGTGTATCAAGCCAAACATGCAAGAAGATGCCA
GACCACTTTGACCAAGCGGTTGTGCTGAACAGGCTGCGGTACTCAGGGATGCTGGAGACTGTGAGAATCCGCAAGCTGGGTATGC
GGTCCGAAGACCTTTACAGGACTTTTACAAAAGGTATAAAGTGTGATGAGGAATCTGGCTCTGCTGAGGAGCTCGGAGGGAAGT
GCACGAGCCTGCTGCAGCTCTATGATGCTCCACAGCGAGTGGCAGCTGGGGAAGACCAAGTCTTTCTCGAGAATCCTTGGAA
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45 AACAAATGAAGAAGGTCTTTATTGTGTGGTGAATAACAGAACTTACAGAGCAATCCTTCTGAGGAGAGATTTGTTGACCTGTA
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50 GAACCTGACCGTGGAGGAAACAGGAAGGAAATAAGCAAGGTGGAAGAGATCCTCGCTGGAGAGAAAGAAATCGAGGAGCTGC
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55 CAGCCCCAGTGGGACAGCAGCGGTGCTGCTCGCCCCACAGTGACGAGGACTCCGGGAGCCTACACAACCTCTCCAGCGCGAGTCCA
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60 TGATGAACCTTTGGAACCGCGCTGGTGGCTCCTCAAGGATGAAACCTTCTTGTGGTTCCGCTCCAAGCAGGAGGCCCTCAAGCAA
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65 GGCACCTTGGATGTGGGGCTGATTGATTTCTGTGTGCTCTGACAGCCCTGATAGACCCAACTCGTTTGTGATCATACGCGCAAC
CGGTGCTGCTCAACCGCGACACGCGGAGAGATGACCACTGGATAACCCCTGCTGCAGAGGTCGAGGTCGAGGAGACCCAGAG
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70 TGTATCCGGCTCTACCAAGCTGCTCAACGAGGCCAAGCTGGTGGTCCAGTGCCATTCAAACGCTGACTACCAAGGAGGCGCCGAT
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TCCAGGGCATCTACAGACAGGGGCATGACCTGCGACCTCTGCGGGACGAGCTGTACTGCCAGCTTATCAAACAGACCAACAAAGTG
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 5 TCTATTGCCATGGCGGCGGCTCCTGCAAGATCACCATCACTCCCAACCACTGCTGCGGAGGTTGGTGGAGAGTTCGCGGCTC
 CTGGCCATGGAGGACAGCAGGAACATGTTTGTCTTGTGAAATACAACCGCCACGTCGACAAAGCCATTGAAAGTGAACCGTCTG
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 10 TCCCACCTCTCGAAGAGGTTTATCCCTGCAGAGACTCAAGGCCCGCATCAGCCAGTCAACCAAAACCTTACCCCTTGTGAACGGC
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 GGAGCAGATGCTGGACATGTGGATTAAGGAAGAAGTCTCTGCTCGAGCCAGTATCATTGACAAGTGGAGGAAATTTACAGGAA
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 AAGGAAGGTGGCTTCCCTCAGGAACCTGCTTGGGTGTACGCGCGGACGCGCTCTCCGTCTACAAGCGTGGAGAGGGAAGACCACT
 15 GGAAGTCTTCCAGTATGAACACATCTCTCTTTTGGGGCAGCCCTGGCGAATACGTATAAGATCGTGGTCGATGAGAGGGAGCTGCT
 CTTTGAACACAGTAGGTTGGATGTGGCCAGCTCAACGCTACGAAATGACATCAGCATGATCGTGAAGAGCGCTACAGCAGCAGAC
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 35 Amino acid sequence for Myosin X (GENBANK ACCESSION No. NM-012334)
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(GENBANK ACCESSION NO. NM_001743)

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SEQ ID NO, GENBANK ACCESSION NO., Length of oligo, Position of First nucleotide of oligo in target nucleic acid, Sequence of oligo

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65 3374, AI672565,,20,187, CCGAGAGGGTGGCGTTGTAG,,
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20 3404,AI672565,,20,7,AGTCACAGCGATGTTGGAGC,,
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708

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10 TCCTGCCCTTGGACATCACACTC
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55 3975, A1138216,,20,91,ATGGACTAACACGCAGCCAT,,
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65 3985, A1138216,,20,31,AATTGATTCCAATATAAAAC,,
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GTTCAGACAGCCCAAGCAACACAGCAAGATGACCATTTCAAAAACAAAAACAAAAACCCCTGCAGGTATTTTTATCTAAC

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AATGAAACTATATTCTCAAGGAGTATTTTGTAGCTTGGTACCAGCTACCTGACAAATTTGAAAATACAGCT
(SEQ ID NO: 3991)

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CTAATACTATAACAATAAAAAAGGAAATAAGTCCCAATGAATATTAATAACCAAAAAATTGTTATGTAATTAATCAAGGAAG
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(SEQ ID NO: 4060)

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4162, AI041482,,20,120,GCAGGTTTAAATGACAGACA,,
40 4163, AI041482,,20,114,TTAAATGACAGACATGTGAG,,
4164, AI041482,,20,108,GACAGACATGTGAGTAATGT,,
4165, AI041482,,20,102,CATGTGAGTAATGTGCTTTA,,
4166, AI041482,,20,96,AGTAATGTGCTTTACAATGT,,
4167, AI041482,,20,90,GTGCTTTACAATGTTACT,,
45 4168, AI041482,,20,84,TACAATGTTACTACTGGCTAT,,
4169, AI041482,,20,78,GTTACTACTGGCTATGTCATT,,
4170, AI041482,,20,72,CTGGCTATGTCATTAGGTGA,,
4171, AI041482,,20,66,ATGTCATTAGGTGATTGGAA,,
4172, AI041482,,20,60,TTAGGTGATTGGAATTTTTT,,
50 4173, AI041482,,20,54,GATTGGAATTTTTTAGCACT,,
4174, AI041482,,20,48,AATTTTTTAGCACTATTAAA,,
4175, AI041482,,20,42,TTAGCACTATTAAAAATGTTA,,
4176, AI041482,,20,36,CTATTAAAAATGTTATGAGAG,,
4177, AI041482,,20,30,AAATGTTATGAGAGCACTGT,,
55 4178, AI041482,,20,24,TATGAGAGCACTGTCAAAAA,,
4179, AI041482,,20,18,AGCACTGTCAAAAAA,,
4180, AI041482,,20,12,GTCAAAAAA,,
4181, AI041482,,20,6,AAAAA,,
(GENBANK ACCESSION NO. AI051839)
60 TTTTTTTTTTTTTTTTTTTTTTTTTTTAGGTAACCTAAGTTCCGTGTTTAAATGATATATTTAGGAAATCTGATATCATTTCAAGTAT
CTTTAAAAACAATCTACTTAATTGTCAACAACCAAGTATGGAATTTACGTAAATCCTGTTACAGATGAGAGAAGGCGGCTGC
TGTGGTGACAGCACAGCTCAGCAAAGAGGTCCAGAGGATGACGTGCACTTCCCGGCGGCTGGAGAGCTCCCCAGGTCTCACC
CATCCGCTTCCATCTCAAGGCTCTGGGCACCCCTCTTGCAGACCTGCTTCTATTCTTTGGACAGTTTGGGAAAAATCAGCTCTT
TAACCTTAAACACTTCGGATCACTTCAAAACAAGATGCTCAGAAAAGGAACTCTAATCCGTCAACCAGGGAAAGATAGTAACTG
65 TCTAATCGCACAGCATCCACAGTGAGCAGCCACC
(SEQ ID NO: 4182)

4183, AI051839,,20,454,GGTGGCTGCTCACTGTGGGA,,
4184, AI051839,,20,448,TGCTCACTGTGGGATGCTGT,,
70 4185, AI051839,,20,442,CTGTGGGATGCTGTGCGATT,,
4186, AI051839,,20,436,GATGCTGTGCGATTAGACAG,,
4187, AI051839,,20,430,GTGCGATTAGACAGTTACTA,,
4188, AI051839,,20,424,TTAGACAGTTACTATCTTTC,,
4189, AI051839,,20,418,AGTTACTATCTTCCCTGGT,,
75 4190, AI051839,,20,412,TATCTTCCCTGGTTGACGG,,

4191, AI051839,,20,406,TCCCTGGTTGACGGATTAGA,,
4192, AI051839,,20,400,GTGACGGATTAGAGTTTCC,,
4193, AI051839,,20,394,GGATTAGAGTTTCCCTTTTC,,
4194, AI051839,,20,388,GAGTTTCCCTTTTCTGAGCA,,
5 4195, AI051839,,20,382,CCCTTTTCTGAGCATCTTGT,,
4196, AI051839,,20,376,TCTGAGCATCTTGTTTTGA,,
4197, AI051839,,20,370,CATCTTGTTTTGAAGTGATC,,
4198, AI051839,,20,364,GTGTTGAAGTGATCCGAAGT,,
4199, AI051839,,20,358,AAAGTGATCCGAAGTGTTAG,,
10 4200, AI051839,,20,352,TCCGAAGTGTTTAGGGTTAA,,
4201, AI051839,,20,346,GTGTTTAGGGTTAAAGAGCG,,
4202, AI051839,,20,340,AGGGTTAAAGAGCGTGATTT,,
4203, AI051839,,20,334,AAAGAGCGTGATTTTCCCAA,,
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15 4205, AI051839,,20,322,TTTCCCAAAGTGTCCAAAGA,,
4206, AI051839,,20,316,AAAGTGTCCAAAGAAATAGA,,
4207, AI051839,,20,310,TCCAAAGAAATAGAAGCAGG,,
4208, AI051839,,20,304,GAAATAGAAGCAGGTCTGCA,,
4209, AI051839,,20,298,GAAGCAGGTCTGCAAGAGGG,,
20 4210, AI051839,,20,292,GGTCTGCAAGAGGGGGTGC,,
4211, AI051839,,20,286,CAAGAGGGGGGTGCCAGAG,,
4212, AI051839,,20,280,GGGGGTGCCAGAGCCTTGA,,
4213, AI051839,,20,274,GCCAGAGCCTTGAGATGGA,,
4214, AI051839,,20,268,AGCCTTGAGATGGAAGCGGG,,
25 4215, AI051839,,20,262,GAGATGGAAGCGGGATGGGG,,
4216, AI051839,,20,256,GAAGCGGGATGGGGTGAGAC,,
4217, AI051839,,20,250,GGATGGGGTGAGACCTGGGG,,
4218, AI051839,,20,244,GGTGAGACCTGGGGAGCTCT,,
4219, AI051839,,20,238,ACCTGGGGAGCTCTCCAGGC,,
30 4220, AI051839,,20,232,GGAGCTCTCCAGGCCGCCGG,,
4221, AI051839,,20,226,CTCCAGGCCGCCGGGAAGCT,,
4222, AI051839,,20,220,GCCGCCGGGAAGCTGCACGT,,
4223, AI051839,,20,214,GGGAAGCTGCACGTATCCT,,
4224, AI051839,,20,208,CTGCACGTATCCTCTGGAC,,
35 4225, AI051839,,20,202,GTATCTCTGACCTCTTT,,
4226, AI051839,,20,196,CTCTGGACCTCTTTGCTGAC,,
4227, AI051839,,20,190,ACCTCTTTGCTGACTGTGTG,,
4228, AI051839,,20,184,TTGCTGACTGTGTGTGTC,,
4229, AI051839,,20,178,ACTGTGTGCTGTCAACACAG,,
40 4230, AI051839,,20,172,TGCTGTCAACACAGCAGCCG,,
4231, AI051839,,20,166,CACCACAGCAGCCGCTTCT,,
4232, AI051839,,20,160,AGCAGCCGCTTCTCTCATC,,
4233, AI051839,,20,154,CGCCTTCTCTCATCTGTAA,,
4234, AI051839,,20,148,CTCTCATCTGTAAACAGGAT,,
45 4235, AI051839,,20,142,TCTGTAAACAGGATTTACG,,
4236, AI051839,,20,136,AACAGGATTTTACGTAAAT,,
4237, AI051839,,20,130,ATTTTACGTAAATTTCCATA,,
4238, AI051839,,20,124,CGTAAATTTCCATACACTTG,,
4239, AI051839,,20,118,TTTCCATACACTTGTTGTT,,
50 4240, AI051839,,20,112,TACACTTGGTTGTTGACAAT,,
4241, AI051839,,20,106,TGGTTGTTGACAATTAAGTA,,
4242, AI051839,,20,100,TTGACAAATTAAGTAGATTGT,,
4243, AI051839,,20,94,ATTAAGTAGATTGTTTTAA,,
4244, AI051839,,20,88,TAGATTGTTTTAAAGATAC,,
55 4245, AI051839,,20,82,GTTTTTAAAGTACTTGAAA,,
4246, AI051839,,20,76,AAAGATACTTGAAATGATAT,,
4247, AI051839,,20,70,ACTTGAAATGATATCAGAAT,,
4248, AI051839,,20,64,AATGATATCAGAAATTCCTA,,
4249, AI051839,,20,58,ATCAGAAATTCCTAAATATA,,
60 4250, AI051839,,20,52,ATTTCTAAATATATCATT,,
4251, AI051839,,20,46,TAAATATATCATTAAACAG,,
4252, AI051839,,20,40,TATCATTAAACAGGAAACT,,
4253, AI051839,,20,34,TAAACAGGAAACTTAGTTA,,
4254, AI051839,,20,28,AGGAAACTTAGTTACCTAAA,,
65 4255, AI051839,,20,22,CTTAGTTACCTAAAAAAA,,
4256, AI051839,,20,16,TACCTAAAAAAA,,
4257, AI051839,,20,10,AAAAAAA,,
4258, AI051839,,20,4,AAAAAAA,,
(GENBANK ACCESSION NO. AJ092429)
70 TTTTTTTTTTTTTTTTTTTTTTCTCTGCTTGTCTAGAACCTGGTAGTGACGGGGTACAAGTCAGTTTCATTGGGCAACTGAAATTG
GGTGGGGTTCGCTCCATGGCGGCAGCAATCAGCAGCTCAAAGGGCCGCTCAGCTGGGGCTGCACATAGTCTGGCTCCGCTGCTA
CTGGTTCCCTCATCCAGCTCAATGATGTCTTCGTCGACATCATTCTGCTCAAAGGTGGGAGTCTCTGTGCTGGCCTGGATGTGGGTG
GCCAGGCTGTGGCTCTCCTTCCAGGATCCGGGCATGGCAATGGCCTTTAGTTTCAGTTTGTCTGGCCGATCTGTCCAACAAGTC
AGTGTCACTGCTGGGGATGTAGTCCGTTTGGCAGATTTGTCCACAGTCCATTGACATGACCCAGCTCCTTTTCTG
75 (SEQ ID NO: 4259)

4260, AI092429,,20,409,CAGAAAAAGGAGCTGGGTCA,,
4261, AI092429,,20,403,AAGGAGCTGGGTCA TGTCAA,,
4262, AI092429,,20,397,CTGGGTCATGTCAATGGACT,,
5 4263, AI092429,,20,391,CATGTCAATGGACTGGTGGA,,
4264, AI092429,,20,385,AATGGACTGGTGACAAATC,,
4265, AI092429,,20,379,CTGGTGGACAAATCTGGCAA,,
4266, AI092429,,20,373,GACAAATCTGGCAAACGGAC,,
4267, AI092429,,20,367,TCTGGCAAACGGACTACATC,,
10 4268, AI092429,,20,361,AAACGGACTACATCCCCCAG,,
4269, AI092429,,20,355,ACTACATCCCCAGCAGTGA,,
4270, AI092429,,20,349,TCCCCAGCAGTGACACTGA,,
4271, AI092429,,20,343,AGCAGTGACACTGACTTGTT,,
4272, AI092429,,20,337,GACACTGACTTGTTGGACAG,,
15 4273, AI092429,,20,331,GACTTGTTGGACAGATCGGC,,
4274, AI092429,,20,325,TTGGACAGATCGGCCAGCAA,,
4275, AI092429,,20,319,AGATCGGCCAGCAAACTGA,,
4276, AI092429,,20,313,GCCAGCAAACTGAACTAAA,,
4277, AI092429,,20,307,AAAACCTGAACTAAAGGCCAT,,
20 4278, AI092429,,20,301,GAACCTAAAGGCCATTGCCCA,,
4279, AI092429,,20,295,AAGGCCATTGCCCATGCCCG,,
4280, AI092429,,20,289,ATTGCCCATGCCCGATCCT,,
4281, AI092429,,20,283,CATGCCCGGATCCTGGAAAG,,
4282, AI092429,,20,277,CGGATCCTGGAAAGGAGAGC,,
25 4283, AI092429,,20,271,CTGGAAAGGAGAGCCAGCAG,,
4284, AI092429,,20,265,AGGAGAGCCAGCAGGCCTGG,,
4285, AI092429,,20,259,GCCAGCAGGCCTGGCACACC,,
4286, AI092429,,20,253,AGGCCTGGCACACCCACATC,,
4287, AI092429,,20,247,GGCACACCCACATCCAGCGC,,
30 4288, AI092429,,20,241,CCCACATCCAGCGCCAGCAC,,
4289, AI092429,,20,235,TCCAGCGCCAGCACAGAGAC,,
4290, AI092429,,20,229,GCCAGCACAGAGACTCCCAC,,
4291, AI092429,,20,223,ACAGAGACTCCCACCTTTGA,,
4292, AI092429,,20,217,ACTCCCACCTTTGAGCAGAA,,
35 4293, AI092429,,20,211,ACCTTTGAGCAGAAATGATGT,,
4294, AI092429,,20,205,GAGCAGAATGATGTCGACGA,,
4295, AI092429,,20,199,AATGATGTCGACGAAGACAT,,
4296, AI092429,,20,193,GTGACGAAGACATCATTGA,,
4297, AI092429,,20,187,GAAGACATCATTGACGTGGA,,
40 4298, AI092429,,20,181,ATCATTGACGTGGATGAGGA,,
4299, AI092429,,20,175,GACGTGGATGAGGAACCACT,,
4300, AI092429,,20,169,GATGAGGAACCACTAGCAGC,,
4301, AI092429,,20,163,GAACCACTAGCAGCGGAGCC,,
4302, AI092429,,20,157,GTAGCAGCGGAGCCAGACTA,,
45 4303, AI092429,,20,151,GCGGAGCCAGACTATGTGCA,,
4304, AI092429,,20,145,CCAGACTATGTGCAGCCCCA,,
4305, AI092429,,20,139,TATGTGCAGCCCCAGCTGAG,,
4306, AI092429,,20,133,CAGCCCCAGCTGAGGCGGCC,,
4307, AI092429,,20,127,CAGCTGAGGCGGCCCTTTGA,,
50 4308, AI092429,,20,121,AGGCGGCCCTTTGAGCTGCT,,
4309, AI092429,,20,115,CCCTTTGAGCTGCTGATTGC,,
4310, AI092429,,20,109,GAGCTGCTGATTGCTGCCGC,,
4311, AI092429,,20,103,CTGATTGCTGCCGCCATGGA,,
4312, AI092429,,20,97,GCTGCCGCCATGGAGCGGAA,,
55 4313, AI092429,,20,91,GCCATGGAGCGGAACCCAC,,
4314, AI092429,,20,85,GAGCGGAACCCACCCAATT,,
4315, AI092429,,20,79,AACCCCAACCAATTCAGTT,,
4316, AI092429,,20,73,ACCCAATTCAGTTGCCAA,,
4317, AI092429,,20,67,TTTCAGTTGCCCAATGAACT,,
60 4318, AI092429,,20,61,TTGCCCAATGAACTGACTTG,,
4319, AI092429,,20,55,AATGAACTGACTTGATACCCC,,
4320, AI092429,,20,49,CTGACTTGATACCCCTGCACT,,
4321, AI092429,,20,43,TGTACCCCTGCACTACCAAG,,
4322, AI092429,,20,37,CCTGCACTACCAAGTTCTAG,,
65 4323, AI092429,,20,31,CTACCAAGTTCTAGCAAGAC,,
4324, AI092429,,20,25,GGTTCTAGCAAGACGAGAAG,,
4325, AI092429,,20,19,AGCAAGACGAGAAGAAAAAA,,
4326, AI092429,,20,13,ACGAGAAGAAAAAAAGAGAG,,
4327, AI092429,,20,7,AGAAAAAAAGAAAAAAAGAGAG,,
70 4328, AI092429,,20,1,AAAAAAAAAAAAAAAAAAAA,,
(GENBANK ACCESSION NO. AI096522)
TTTTTTTTTTTTTTTTTTTTTACAGGCACTCAGCTTTTATGGGGCCAGCAGGTAGGAAAACAGCAAATCCAAACCCCCATTA
TTTCCCTTGGGGCATAAGCTCCACTGGTGGTTACTTAATGTTCAAAGGCCTCCACTGTATTCAATTAAGCAGGGATCAGATGCCACTA
TCCAAACCCCTCATTCCTTGACCCCGAACCCAAAGAGC
(SEQ ID NO: 4329)

4330, AI096522,,20,198,GCTCTTTTGGGTTTCGGGGTC,,
4331, AI096522,,20,192,TTGGGTTTCGGGGTCAAGGGA,,
4332, AI096522,,20,186,TCGGGGTCAAGGGAATGAGG,,
5 4333, AI096522,,20,180,TCAAGGGAATGAGGGGTTTG,,
4334, AI096522,,20,174,GAATGAGGGGTTTGGATAGT,,
4335, AI096522,,20,168,GGGGTTTGGATAGTGGCATC,,
4336, AI096522,,20,162,TGGATAGTGGCATCTGATCC,,
4337, AI096522,,20,156,GTGGCATCTGATCCCTGCTT,,
10 4338, AI096522,,20,150,TCTGATCCCTGCTTAATGAA,,
4339, AI096522,,20,144,CCCTGCTTAATGAATACAGT,,
4340, AI096522,,20,138,TTAATGAATACAGTGGAGGC,,
4341, AI096522,,20,132,AATACAGTGGAGGCCTTGA,,
4342, AI096522,,20,126,GTGGAGGCCTTTGAAACATT,,
15 4343, AI096522,,20,120,GCCTTTGAAACATTAGAGTA,,
4344, AI096522,,20,114,GAAACATTAGAGTAACCACC,,
4345, AI096522,,20,108,TTAGAGTAACCACCAAGTGA,,
4346, AI096522,,20,102,TAACCACCAAGTGGAGCTATG,,
4347, AI096522,,20,96,CCAAGTGGAGCTATGCCCCAA,,
20 4348, AI096522,,20,90,GAGCTATGCCCCAAGGGA,,
4349, AI096522,,20,84,TGCCCCAAGGGAATAATGG,,
4350, AI096522,,20,78,AAGGGAATAATGGGGGGTT,,
4351, AI096522,,20,72,AATAATGGGGGGTTTGAAT,,
4352, AI096522,,20,66,GGGGGGTTTGAATTTGCTG,,
25 4353, AI096522,,20,60,TTTGAATTTGCTGGTTTCC,,
4354, AI096522,,20,54,ATTTGCTGGTTTCTACCTG,,
4355, AI096522,,20,48,TGGTTTCTACCTGCTGGGC,,
4356, AI096522,,20,42,CCTACCTGCTGGGCCCCATA,,
4357, AI096522,,20,36,TGCTGGGCCCCATAAAGCT,,
30 4358, AI096522,,20,30,GCCCCATAAAGCTGAGTGC,,
4359, AI096522,,20,24,TAAAAGCTGAGTGCCTGTAA,,
4360, AI096522,,20,18,CTGAGTGCCTGTAAAAA,,
4361, AI096522,,20,12,GCCTGTAAAAA,,
4362, AI096522,,20,6,AAAAA,,
35 (GENBANK ACCESSION NO. AI122807)
TTTTTTTTTTTTTTTTTTTTTAAACAACCAAGGTTTACTTCTCACTTACATGTCTTCATGATGTGACTGGGACTCTGTTCGCA
TCATCTTCCCTCCAATCAAGGCTGATCGTGCATATGCTCTCTGGAACACTGATGATTGCCATGGCAAAGAGAAAAAGATTCTGG
AAGGTCTTGCATCAACAATTAATGCTATGCTCAACACTTAATTCGGAGAACATGTCATGTAAGTTCAACCCCATCACAGGGAGGCCAG
GGCATACAATCCTCCTATATTCCTTAAACAGGCGGAAAGAGGAAAAAGAAACCAGCGAATGAGTTTGAGAAGCTGCCCTCTGAGAAA
40 GCGAAGCTCTTAAAAATG
(SEQ ID NO: 4363)

4364, AI122807,,20,348,CATTTTTAAGAGTTCGCTTT,,
4365, AI122807,,20,342,TAAGAGTTCGCTTCTCAGA,,
45 4366, AI122807,,20,336,TTGCTTTCTCAGAGGGCAG,,
4367, AI122807,,20,330,TTCTCAGAGGGCAGCTTCTC,,
4368, AI122807,,20,324,GAGGGCAGCTTCTCAAACCTC,,
4369, AI122807,,20,318,AGCTTCTCAAACCTCATTCGC,,
4370, AI122807,,20,312,TCAAACCTCATTCGCTGGTTT,,
50 4371, AI122807,,20,306,TCATTCGCTGGTTTCTTTTC,,
4372, AI122807,,20,300,GCTGGTTTCTTTTCTCTTT,,
4373, AI122807,,20,294,TTCTTTTCTCTTTTCCGCT,,
4374, AI122807,,20,288,TCCTTTTCCGCTGTTTAA,,
4375, AI122807,,20,282,TTCCGCTGTTTAAAGGAATA,,
55 4376, AI122807,,20,276,CTGTTTAAAGGAATATAGGAG,,
4377, AI122807,,20,270,AAGGAATATAGGAGGATTGT,,
4378, AI122807,,20,264,TATAGGAGGATTGTATGCC,,
4379, AI122807,,20,258,AGGATTGTATGCCCTGGCCT,,
4380, AI122807,,20,252,GTATGCCCTGGCCTCCCTGT,,
60 4381, AI122807,,20,246,CCTGGCTCCCTGTGATGGG,,
4382, AI122807,,20,240,CTCCCTGTGATGGGGTTGAA,,
4383, AI122807,,20,234,GTGATGGGGTTGAACTACAT,,
4384, AI122807,,20,228,GGGTTGAACTACATGACATG,,
4385, AI122807,,20,222,AACTACATGACATGTTCTCC,,
65 4386, AI122807,,20,216,ATGACATGTTCTCGAATTA,,
4387, AI122807,,20,210,TGTTCTCCGAATTAAGTGTG,,
4388, AI122807,,20,204,CCGAATTAAGTGTGAGCATA,,
4389, AI122807,,20,198,TAAGTGTGAGCATAGCATTT,,
4390, AI122807,,20,192,TGAGCATAGCATTTAATTGT,,
70 4391, AI122807,,20,186,TAGCATTTAATTGTTGATGC,,
4392, AI122807,,20,180,TTAATTGTTGATGCAAGACC,,
4393, AI122807,,20,174,GTGATGCAAGACCTTCCAG,,
4394, AI122807,,20,168,GCAAGACCTTCCAGAACTCT,,
4395, AI122807,,20,162,CCTCCAGAACTCTTTTCT,,
75 4396, AI122807,,20,156,AGAACTCTTTTCTCTTGC,,

4397,AI122807,,20,150,CTTTTCTCTTTGCCATGGC,,
4398,AI122807,,20,144,CTCTTTGCCATGGCAATCAT,,
4399,AI122807,,20,138,GCCATGGCAATCATCAGTGT,,
4400,AI122807,,20,132,GCAATCATCAGTGTTCAGA,,
5 4401,AI122807,,20,126,ATCAGTGTTCAGAGAGCAT,,
4402,AI122807,,20,120,GTTCAGAGAGCATATGCAC,,
4403,AI122807,,20,114,GAGAGCATATGCACGATCAG,,
4404,AI122807,,20,108,ATATGCACGATCAGCCTTGG,,
4405,AI122807,,20,102,ACGATCAGCCTTGGTATTGG,,
10 4406,AI122807,,20,96,AGCCTTGGTATTGGAGGGAA,,
4407,AI122807,,20,90,GGTATTGGAGGGAAAGATGAT,,
4408,AI122807,,20,84,GGAGGGAAGATGATGCGGAA,,
4409,AI122807,,20,78,AAGATGATGCGGAACAGAGT,,
4410,AI122807,,20,72,ATGCGGAACAGAGTCCAGT,,
15 4411,AI122807,,20,66,AACAGAGTCCAGTCACATC,,
4412,AI122807,,20,60,GTCCCAGTCACATCATGAAG,,
4413,AI122807,,20,54,GTACATCATGAAGGACATG,,
4414,AI122807,,20,48,TCATGAAGGACATGTAAAGT,,
4415,AI122807,,20,42,AGGACATGTAAAGTGAGAAG,,
20 4416,AI122807,,20,36,TGTAAAGTGAGAAGTAAACC,,
4417,AI122807,,20,30,GTGAGAAGTAAACCTTGGTT,,
4418,AI122807,,20,24,AGTAAACCTTGGTTGTTTTA,,
4419,AI122807,,20,18,CCTTGGTTGTTTTAAAAAAA,,
4420,AI122807,,20,12,TTGTTTTAAAAAATAAATAA,,
25 4421,AI122807,,20,6,TAAAAAATAAATAAATAA,,
(GENBANK ACCESSION NO. AI041212)
TTTTTTTTTTTTTTTTTTTTTTTAGATGAAGAACAGCTTTATTAAGTAAATCCATTTATATTGGAAGCTCATATATGCTACAACCTTA
GTCTTCTCAATGTTAAAAATAATTTTTTCTACCATGTAAACCTAGCCTTCTCTTTGACTTTTGAAAAATTATTTTTGGTCCCTGAGA
GTTATAAAAAAGGAGCTGGAGTCCAGTAACATATTTGCTGATAGCTGGGTCTTAATCCACCTTTGTCCACAAACACTGGTCCACG
30 GCCACCTCCAGGTCTCTCTGTACAGCTTTTACAAGAGGGTAAATATATTTATTTGGTGTTCGATTCAAGTCAATTACCTCTCTG
GCATAGTCTGAAATCTCTTCTCTCTT
(SEQ ID NO: 4422)

4423,AI041212,,20,362,AAAGGAGAAAGAATTTTCAGG,,
35 4424,AI041212,,20,356,GAAAGAAATTCAGGACTATG,,
4425,AI041212,,20,350,ATTTTCAGGACTATGCCAGAG,,
4426,AI041212,,20,344,GGACTATGCCAGAGAGGTAA,,
4427,AI041212,,20,338,TGCCAGAGAGGTAAATTGAAC,,
4428,AI041212,,20,332,AGAGGTAATTGAACCTTGAAT,,
40 4429,AI041212,,20,326,AATTGAACCTTGAATCGGAAA,,
4430,AI041212,,20,320,ACTTGAATCGGAAACACCAA,,
4431,AI041212,,20,314,ATCGGAAACACCAAATAAAT,,
4432,AI041212,,20,308,AACACCAAATAAATATATTT,,
4433,AI041212,,20,302,AAATAAATATATTTACCTC,,
45 4434,AI041212,,20,296,ATATATTTACCTCTTGTA,,
4435,AI041212,,20,290,TTACCTCTTGTAAGGCTG,,
4436,AI041212,,20,284,TCTTGTAAGGCTGTACAGG,,
4437,AI041212,,20,278,AAAAGCTGTACAGGAAGGAC,,
4438,AI041212,,20,272,TGTACAGGAAGGACCTGGAG,,
50 4439,AI041212,,20,266,GGAAGGACCTGGAGGTGGCC,,
4440,AI041212,,20,260,ACCTGGAGGTGGCCGTGGAC,,
4441,AI041212,,20,254,AGGTGGCCGTGGACCAAGTGT,,
4442,AI041212,,20,248,CCGTGGACCAAGTGTGTGG,,
4443,AI041212,,20,242,ACCAAGTGTGTGGACAAAG,,
55 4444,AI041212,,20,236,GTGTGGACAAAGGTGGAT,,
4445,AI041212,,20,230,GGACAAAGGTGGATTAAGAC,,
4446,AI041212,,20,224,AGGTGGATTAAGACCCAGCT,,
4447,AI041212,,20,218,ATTAAGACCCAGCTATCAGG,,
4448,AI041212,,20,212,ACCCAGCTATCAGGCAATG,,
60 4449,AI041212,,20,206,CTATCAGGCAATGATGTTA,,
4450,AI041212,,20,200,GGCAATGATGTTACTGGAG,,
4451,AI041212,,20,194,TGATGTTACTGGAGTCCAGC,,
4452,AI041212,,20,188,TACTGGAGTCCAGCTCCCTT,,
4453,AI041212,,20,182,AGTCCAGCTCCCTTTTTATA,,
65 4454,AI041212,,20,176,GCTCCCTTTTTATACTCTC,,
4455,AI041212,,20,170,TTTTTATACTCTCAGGGAC,,
4456,AI041212,,20,164,TAACTCTCAGGGACCAAAT,,
4457,AI041212,,20,158,TCAGGACCAAAATATAATT,,
4458,AI041212,,20,152,ACCAAAATATAATTTTCAAA,,
70 4459,AI041212,,20,146,ATATAATTTTCAAAAGTCAA,,
4460,AI041212,,20,140,TTTTCAAAAGTCAAAAGAGAA,,
4461,AI041212,,20,134,AAAGTCAAAAGAGAAGGCTAG,,
4462,AI041212,,20,128,AAAGAGAAGGCTAGGTTTTA,,
4463,AI041212,,20,122,AAGGCTAGGTTTACATGGT,,
75 4464,AI041212,,20,116,AGGTTTTACATGGTAGAAAA,,

4465, A1041212,,20,110,TACATGGTAGAAAAAATTA,,
4466, A1041212,,20,104,GTAGAAAAAATTATTTTAA,,
4467, A1041212,,20,98,AAAAATTATTTTAAACATTG,,
4468, A1041212,,20,92,TATTTTAAACATTGAGAAAGA,,
5 4469, A1041212,,20,86,TAACATTGAGAAGACTAAGT,,
4470, A1041212,,20,80,TGAGAAGACTAAGTTGTAGC,,
4471, A1041212,,20,74,ACTAAGTTGTAGCATATAT,,
4472, A1041212,,20,68,GTGTAGCATATATGAGCTT,,
4473, A1041212,,20,62,GCATATATGAGCTTCAAATA,,
10 4474, A1041212,,20,56,ATGAGCTTCAAATATAAATG,,
4475, A1041212,,20,50,TTCAAATATAAATGGATTTC,,
4476, A1041212,,20,44,TATAAATGGATTTCAGTTAA,,
4477, A1041212,,20,38,TGGATTTCAGTTAATAAAGC,,
4478, A1041212,,20,32,TCAGTTAATAAAGCTGTTCT,,
15 4479, A1041212,,20,26,ATAAAGCTGTTCTTCATCT,,
4480, A1041212,,20,20,GCTGTTCTTCATCTAAAAAA,,
4481, A1041212,,20,14,CTTCATCTAAAAAATAAATA,,
4482, A1041212,,20,8,CTAAAAAATAAATAAATAAATA,,
4483, A1041212,,20,2,AAAAAATAAATAAATAAATA,,
20 (GENBANK ACCESSION NO. A1125651)
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ATGACGACTTTGGACATTGCTAGGTAATTGTCAAATTTGTGCAATTGAACAGCAGCAAAAATTTCAAAGCTGGTGTGCCCTCGCTGA
CACGAAATGAATTGTCAATTTCTGAACATTCACCAAGCCTGCCAGCGCTAGGCCTAGGTTTCAGCAGCACACAATAGTGAAGCCC
CCATTCAAGCGGGCTTCGTTTCACCAGCGTACGTACACGTCCTGGAGCAGCGAGACCAGAGGAGCTGGGAAAGCCAGGGCTGAG
25 CCTTGTGCTTTTGCCCTTTTAAGGGAGGA
(SEQ ID NO: 4484)

4485, A1125651,,20,358,TCCTCCCTTAAAAGGGCAA,,
4486, A1125651,,20,352,CTTAAAGGGCAAAGCACA,,
30 4487, A1125651,,20,346,AGGGCAAAGCACAAGGCTC,,
4488, A1125651,,20,340,AAAGCACAAGGCTCAGCCCT,,
4489, A1125651,,20,334,CAAGGCTCAGCCCTGGCTTT,,
4490, A1125651,,20,328,TCAGCCCTGGCTTTCCAGC,,
4491, A1125651,,20,322,CTGGCTTTCCAGCTCCTCT,,
35 4492, A1125651,,20,316,TTCCAGCTCCTCTGGTCTC,,
4493, A1125651,,20,310,GCTCCTCTGGTCTCGTGCT,,
4494, A1125651,,20,304,CTGGTCTCGTGCTCCACGG,,
4495, A1125651,,20,298,TCGCTGCTCCACGGACGTGT,,
4496, A1125651,,20,292,CTCCACGGACGTGTGACGTA,,
40 4497, A1125651,,20,286,GGACGTGTGACGTACGCTGG,,
4498, A1125651,,20,280,GTGACGTACGCTGGTGAAAC,,
4499, A1125651,,20,274,TACGCTGGTGAAACGAAGCC,,
4500, A1125651,,20,268,GGTGAAACGAAGCCCGCTTG,,
4501, A1125651,,20,262,ACGAAGCCCGCTTGAATGGG,,
45 4502, A1125651,,20,256,CCCGCTTGAATGGGGGCTTC,,
4503, A1125651,,20,250,TGAATGGGGGCTTCACTATT,,
4504, A1125651,,20,244,GGGGCTTCACTATTGTGTGC,,
4505, A1125651,,20,238,TCACTATTGTGTGCTGCTGA,,
4506, A1125651,,20,232,TTGTGTGCTGCTGAACCTAG,,
50 4507, A1125651,,20,226,GCTGCTGAACCTAGGCCTAG,,
4508, A1125651,,20,220,GAACCTAGGCCTAGCGCCTG,,
4509, A1125651,,20,214,AGGCCTAGCGCCTGGCAGGC,,
4510, A1125651,,20,208,AGCGCCTGGCAGGCTTTGGT,,
4511, A1125651,,20,202,TGGCAGGCTTTGGTGAATGT,,
55 4512, A1125651,,20,196,GCTTTGGTGAATGTTTCAGAA,,
4513, A1125651,,20,190,GTGAATGTTTCAGAAATGAC,,
4514, A1125651,,20,184,GTTCAGAAATGACAATTCA,,
4515, A1125651,,20,178,AAAATGACAATTCAATTCGT,,
4516, A1125651,,20,172,ACAATTCATTTCTGTGTCAGC,,
60 4517, A1125651,,20,166,CATTTCTGTGTCAGCGAGGGC,,
4518, A1125651,,20,160,GTGTCAGCGAGGGCACACCA,,
4519, A1125651,,20,154,CGGAGGGCACACCAAGCTTTG,,
4520, A1125651,,20,148,GCACACCAAGCTTTGAATATT,,
4521, A1125651,,20,142,CAGCTTTGAATATTTTGCTG,,
65 4522, A1125651,,20,136,TGAATATTTTGCTGCTGTT,,
4523, A1125651,,20,130,TTTTGCTGCTGTTCAAATGC,,
4524, A1125651,,20,124,TGCTGTTCAAATGCACAATT,,
4525, A1125651,,20,118,TCAAATGCACAATTTTGACA,,
4526, A1125651,,20,112,GCACAATTTTGACAATTACC,,
70 4527, A1125651,,20,106,TTTGAACAATTACCTAGCAA,,
4528, A1125651,,20,100,CAATTACCTAGCAATGTCCA,,
4529, A1125651,,20,94,CCTAGCAATGTCCAAAGTCG,,
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4531, A1125651,,20,82,CAAAGTCGTCATAATTGTTA,,
75 4532, A1125651,,20,76,CGTCATAATTGTTAGTGTCT,,

4533, AI125651,,20,70,AATTGTTAGTGTCTTGACCG,,
4534, AI125651,,20,64,TAGTGTCTTGACCGTGATGT,,
4535, AI125651,,20,58,CTTGACGTGATGTTCCCTTA,,
4536, AI125651,,20,52,CGTGATGTTCCCTTATAACCA,,
5 4537, AI125651,,20,46,GTTCCTTATAACCATGTAAT,,
4538, AI125651,,20,40,TATAACCATGTAATAAATAC,,
4539, AI125651,,20,34,CATGTAATAAATACAGTGTG,,
4540, AI125651,,20,28,ATAAATACAGTGTGAAGTCT,,
4541, AI125651,,20,22,ACAGTGTGAAGTCTCAAAAA,,
10 4542, AI125651,,20,16,TGAAGTCTCAAAAAAAAAA,,
4543, AI125651,,20,10,CTCAAAAAAAAAAAAAAAAA,,
4544, AI125651,,20,4,AAAAAAAAAAAAAAAAAAAA,,
(GENBANK ACCESSION NO. AI001174)
TCATGGGTCACTGAGGCTTTTATTTTGTAGCACAAAACACCGGGATCTAGCCTGTGGCACCCCGGAGATGACACGAGGCTCACAT
15 GACTCTAGACACTTGGTGGAAAGTGAGGCGAGAAAAACAATGACTTGGGCCAATTACACGACTGCAAAGCTAGAGCTGCCAACAG
GGCTCCAGGGAGCTTGGCTTCTGTAGAAGTCTGTGACGTTCACTTCTTGTCAACAGGGCAGGCGCAATAGTTTTATTGATGTGCT
CAACAGCCTTTGAGACACCCCTTCCCATATATGCGAGTCTTATCATTTGTCCCGGAGCTCTAGGGCTCATAGATACCAGTTTGAAGC
ACCACTGGGCACAGCAGCTCTGAAGAGACCTTTTCAGGTGAACAGATCAACCTCAACAGTGGGATTCCCGGAGAGTCCAAGATCT
CCCGGCATGATCTCGAGAATAGACATGGTGAACTTTACGCCACTGGGTCTCGTCGCTAGAGAGGAAGCGGAGTGTGCTTCAGAC
20 AC
(SEQ ID NO: 4545)

4546, AI001174,,20,502,GTGTCTGAAGCACACTCCGC,,
4547, AI001174,,20,496,GAAGCACACTCCGCTTCCTC,,
25 4548, AI001174,,20,490,CACTCCGCTTCCTCTCTAGG,,
4549, AI001174,,20,484,GCTTCCTCTCTAGGCGACGA,,
4550, AI001174,,20,478,TCTCTAGGCGACGAGACCCA,,
4551, AI001174,,20,472,GGCGACGAGACCCAGTGGCT,,
4552, AI001174,,20,466,GAGACCCAGTGGCTGAAAGT,,
30 4553, AI001174,,20,460,CAGTGGCTGAAAGTTACCA,,
4554, AI001174,,20,454,CTGAAAGTTACCATGTCTA,,
4555, AI001174,,20,448,GTTCACCATGTCTATTCTCG,,
4556, AI001174,,20,442,CATGTCTATTCTCGAGATCC,,
4557, AI001174,,20,436,TATTCTCGAGATCCATGCCG,,
35 4558, AI001174,,20,430,CGAGATCCATGCCGGGAGAT,,
4559, AI001174,,20,424,CCATGCCGGGAGATCTTGGA,,
4560, AI001174,,20,418,CGGGAGATCTTGGACTCTCG,,
4561, AI001174,,20,412,ATCTTGGACTCTCGGGGAA,,
4562, AI001174,,20,406,GACTCTCGCGGGAATCCAC,,
40 4563, AI001174,,20,400,CGCGGGAATCCCACTGTTGA,,
4564, AI001174,,20,394,AATCCCACTGTTGAGGTTGA,,
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4566, AI001174,,20,382,GAGGTTGATCTGTTCACTG,,
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45 4568, AI001174,,20,370,TTCACCTGAAAAGGTCTCTT,,
4569, AI001174,,20,364,TGAAAAGGTCTCTTCAGAGC,,
4570, AI001174,,20,358,GGTCTCTTCAGAGCTGCTGT,,
4571, AI001174,,20,352,TTCAAGCTGCTGTGCCAG,,
4572, AI001174,,20,346,GCTGCTGTGCCAGTGGTGC,,
50 4573, AI001174,,20,340,GTGCCAGTGGTGTCTCAAA,,
4574, AI001174,,20,334,AGTGGTGTCTCAAACTGGTA,,
4575, AI001174,,20,328,GCTTCAAACTGGTATCTATG,,
4576, AI001174,,20,322,AACTGGTATCTATGAGGCC,,
4577, AI001174,,20,316,TATCTATGAGGCCCTAGAGC,,
55 4578, AI001174,,20,310,TGAGGCCCTAGAGCTCCGGG,,
4579, AI001174,,20,304,CCTAGAGCTCCGGGACAATG,,
4580, AI001174,,20,298,GCTCCGGGACAATGATAAGA,,
4581, AI001174,,20,292,GGACAATGATAAGACTCGCA,,
4582, AI001174,,20,286,TGATAAGACTCGCATATATG,,
60 4583, AI001174,,20,280,GACTCGCATATATGGGGAAG,,
4584, AI001174,,20,274,CATATATGGGGAAGGGTGTCT,,
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4591, AI001174,,20,232,ATAAAACTATTGCGCCTGCC,,
4592, AI001174,,20,226,CTATTGCGCCTGCCCTGGTT,,
70 4593, AI001174,,20,220,CGCCTGCCCTGGTTAGCAAG,,
4594, AI001174,,20,214,CCCTGGTTAGCAAGAAACTG,,
4595, AI001174,,20,208,TTAGCAAGAACTGAACGTC,,
4596, AI001174,,20,202,AGAAACTGAACGTCACAGAA,,
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75 4598, AI001174,,20,190,TCACAGAACTTCTACAGAAG,,

4599, AI001174,,20,184,AACTTCTACAGAAGCCAAGC,,
4600, AI001174,,20,178,TACAGAAGCCAAGCTCCCTG,,
4601, AI001174,,20,172,AGCCAAGCTCCCTGGAGCCC,,
4602, AI001174,,20,166,GCTCCCTGGAGCCCTGTTGG,,
5 4603, AI001174,,20,160,TGGAGCCCTGTTGGCAGCTC,,
4604, AI001174,,20,154,CCTGTTGGCAGCTCTAGCTT,,
4605, AI001174,,20,148,GGCAGCTCTAGCTTTGCAGT,,
4606, AI001174,,20,142,TCTAGCTTTGCAGTCGTGTA,,
4607, AI001174,,20,136,TTTGAGTCGTGTAATTGGC,,
10 4608, AI001174,,20,130,GTCTGTGTAATTGGCCCAAGT,,
4609, AI001174,,20,124,TAATTGGCCCAAGTCATTGT,,
4610, AI001174,,20,118,GCCCAAGTCATTGTTTTTCT,,
4611, AI001174,,20,112,GTCAATTGTTTTCTCGCCTC,,
4612, AI001174,,20,106,GTGTTTTCTCGCCTCACTTTC,,
15 4613, AI001174,,20,100,CTCGCCTCACTTTCCACCAA,,
4614, AI001174,,20,94,TCACTTTCCACCAAGTGTCT,,
4615, AI001174,,20,88,TCCACCAAGTGTCTAGAGTC,,
4616, AI001174,,20,82,AAGTGTCTAGAGTCATGTGA,,
4617, AI001174,,20,76,CTAGAGTCATGTGAGCCTCG,,
20 4618, AI001174,,20,70,TCATGTGAGCCTCGTGTCTAT,,
4619, AI001174,,20,64,GAGCCTCGTGTCTATCTCCGG,,
4620, AI001174,,20,58,CGTGTCTATCTCCGGGGTGCC,,
4621, AI001174,,20,52,ATCTCCGGGGTGCCACAGGC,,
4622, AI001174,,20,46,GGGGTGCCACAGGCTAGATC,,
25 4623, AI001174,,20,40,CCACAGGCTAGATCCCGGT,,
4624, AI001174,,20,34,GCTAGATCCCGGTGGTTTT,,
4625, AI001174,,20,28,TCCCGGTGGTTTTGTGCTC,,
4626, AI001174,,20,22,GTGTTTTGTGCTCAAAATA,,
4627, AI001174,,20,16,TTGTGCTCAAAATAAAAAGC,,
30 4628, AI001174,,20,10,TCAAAATAAAAAGCCTCAGT,,
4629, AI001174,,20,4,TAAAAAGCCTCAGTGACCCA,,
(GENBANK ACCESSION NO. AI024215)
TTTTTTTTTTTTTTTTTTTTTTTGGACAGTTGATGAAGTGGTGGCTTTAATTTGCGATTCTGTGCAAAACATTTGATAATGGGAATTG
GATGTGTAGGTATTGGGCTTTCTCGTGACACTGAAATTCATTGAACAACACCTTATTTCTGTATAGAGAATGGTGCTAGG
35 GGCCAGCGTCAAAATTTGAAGATGAAGTCTGACTGAAGGTCTCGTTTGGAGTTGGGGTGGGGTGAAGAGTAGACAACTCGGCCAG
AGTGATCGGAAGTTGGCGGCTGTCTGGGGGAGTTGGGTCAGGAAGCCCCTTCTTTCCGCCACCGATGGGGCACGTC
(SEQ ID NO: 4630)

4631, AI024215,,20,318,GACGTGCCCCATCGGTGGCG,,
40 4632, AI024215,,20,312,CCCCATCGGTGGCGAAAGAA,,
4633, AI024215,,20,306,CGGTGGCGAAAGAGGGGCT,,
4634, AI024215,,20,300,CGAAAGAGGGGCTTCTGA,,
4635, AI024215,,20,294,AAGGGGCTTCTGACCCAAC,,
4636, AI024215,,20,288,CTTCTGACCCAACCTCCCC,,
45 4637, AI024215,,20,282,GACCCAACCTCCCCAGACAG,,
4638, AI024215,,20,276,ACTCCCCAGACAGCCGCCA,,
4639, AI024215,,20,270,CCAGACAGCCGCCAACCTCCG,,
4640, AI024215,,20,264,AGCCGCCAACCTCCGATCACT,,
4641, AI024215,,20,258,CAACTCCGATCACTCTGGCC,,
50 4642, AI024215,,20,252,CGATCACTCTGGCCGAGTTT,,
4643, AI024215,,20,246,CTCTGGCCGAGTTGTCTAC,,
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4645, AI024215,,20,234,TTGTCTACTCTTACCCCAAC,,
4646, AI024215,,20,228,ACTCTTACCCCAACCCCAAC,,
55 4647, AI024215,,20,222,CACCCACCCCAACTCCAAA,,
4648, AI024215,,20,216,ACCCCAACTCCAAACGATGA,,
4649, AI024215,,20,210,ACTCCAAACGATGACCTTCA,,
4650, AI024215,,20,204,AACGATGACCTTCAGTCAGA,,
4651, AI024215,,20,198,GACCTTCAGTCAGACTTCAT,,
60 4652, AI024215,,20,192,CAGTCAGACTTCATCTTCAA,,
4653, AI024215,,20,186,GACTTCATCTTCAAATTTGA,,
4654, AI024215,,20,180,ATCTTCAAATTTGACGCTGG,,
4655, AI024215,,20,174,AAATTTGACGCTGGCCCTA,,
4656, AI024215,,20,168,GACGCTGGCCCTAGCACCA,,
65 4657, AI024215,,20,162,GGCCCTAGCACCAATTCTCT,,
4658, AI024215,,20,156,TAGCACCAATTCTCTATACAG,,
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4660, AI024215,,20,144,CTATACAGGAAATAAGGTGT,,
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70 4662, AI024215,,20,132,TAAGGTGTTGTTCAATGAAT,,
4663, AI024215,,20,126,GTGTTCAATGAATGGAATT,,
4664, AI024215,,20,120,CAATGAATGGAATTTCAAGTG,,
4665, AI024215,,20,114,ATGGAATTTCAAGTGTCCACG,,
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75 4667, AI024215,,20,102,TGTCCACGAGAAAGCCCAAT,,

4668, A1024215,,20,96,CGAGAAAGCCCAATACCTAC,,
4669, A1024215,,20,90,AGCCCAATACCTACACATCC,,
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5 4672, A1024215,,20,72,CCAATTCCTTATCAAATG,,
4673, A1024215,,20,66,CCCATTATCAAATGTTTGC,,
4674, A1024215,,20,60,ATCAAATGTTTGCACAAGAA,,
4675, A1024215,,20,54,TGTTTGCACAAGAATCGCAA,,
4676, A1024215,,20,48,CACAAGAATCGCAAATTAATA,,
10 4677, A1024215,,20,42,AATCGCAAATTAAGGCCACC,,
4678, A1024215,,20,36,AAATTAAGGCCACCATTCA,,
4679, A1024215,,20,30,AAGCCACCATTCACTCACT,,
4680, A1024215,,20,24,CACTTCATCACTGGTCAA,,
4681, A1024215,,20,18,CATCACTGGTCAAAAAA,,
15 4682, A1024215,,20,12,CTGGTCAAAAAA,,
4683, A1024215,,20,6,AAAAA,,
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TGTCTCAGGCTAGATTGGTATTGTATAAGTAAGCTTTGTGTAGAGGATGATAAGAAATAAATTTAAATTTAATTGAACAAATCC
20 AGGCACCAGAGGCCAACTTAAAGCTTAAATGCTAAATAAGCCAGCTGCCAAAAAGGCCAAGCTGGTGTGTACAGCTGTTACCA
TCATGCAACAAAAATATAAATCT
(SEQ ID NO: 4684)

4685, A1034360,,20,267,AGATTTTATTTTTGTTC,,
25 4686, A1034360,,20,261,TATTTTTTGTTCATGATG,,
4687, A1034360,,20,255,TTTGTTCATGATGGTAAAC,,
4688, A1034360,,20,249,GCATGATGGTAAACAGCTGT,,
4689, A1034360,,20,243,TGGTAAACAGCTGTAACCCAC,,
4690, A1034360,,20,237,ACAGCTGTAAACACCAGCTT,,
30 4691, A1034360,,20,231,GTAACCACCAGCTTGGCCTT,,
4692, A1034360,,20,225,ACCAGCTTGGCCTTTTTGGC,,
4693, A1034360,,20,219,TTGGCCTTTTTGGCAGCTGC,,
4694, A1034360,,20,213,TTTTTGGCAGCTGGCTTTAT,,
4695, A1034360,,20,207,GCAGCTGGCTTTATTTAGCA,,
35 4696, A1034360,,20,201,GGCTTTATTTAGCATTTTAA,,
4697, A1034360,,20,195,ATTTAGCATTTTAAAGCTTTA,,
4698, A1034360,,20,189,CATTTTAAAGCTTTAAGTTTG,,
4699, A1034360,,20,183,AAGCTTTAAGTTTGCTCTG,,
4700, A1034360,,20,177,TAAGTTTGCTCTGCTGCCT,,
40 4701, A1034360,,20,171,TGCCTCTGGTGCCTGGAATT,,
4702, A1034360,,20,165,TGGTGCCTGGAATTGTTCAA,,
4703, A1034360,,20,159,CTGGAATTGTTCAATTAATA,,
4704, A1034360,,20,153,TTGTTCAATTAATAATTTAA,,
4705, A1034360,,20,147,AAATTAATAATTTAATTTAT,,
45 4706, A1034360,,20,141,AAATTTAATAATTTATCTTAT,,
4707, A1034360,,20,135,AAATTTATCTTATCATCCT,,
4708, A1034360,,20,129,ATTCTTATCATCCTCTAACA,,
4709, A1034360,,20,123,ATCATCCTCTAACACAAAGC,,
4710, A1034360,,20,117,CTCTAACACAAAGCTTACTT,,
50 4711, A1034360,,20,111,CACAAAGCTTACTTATACAA,,
4712, A1034360,,20,105,GCTTACTTATACAAATACCA,,
4713, A1034360,,20,99,TTATACAATACCAATCTAG,,
4714, A1034360,,20,93,AATACCAATCTAGCCTGAG,,
4715, A1034360,,20,87,AAATCTAGCCTGAGACACTT,,
55 4716, A1034360,,20,81,AGCCTGAGACACTTGTCTT,,
4717, A1034360,,20,75,AGACACTTGTCTTGAATCG,,
4718, A1034360,,20,69,TTGTTCTTGAATCGATTCTT,,
4719, A1034360,,20,63,TTGAATCGATTCTTTTTTAA,,
4720, A1034360,,20,57,CGATTCTTTTTTAAATAATA,,
60 4721, A1034360,,20,51,TTTTTTAAATAATAAGTTCA,,
4722, A1034360,,20,45,AAATAATAAGTTCAATATGA,,
4723, A1034360,,20,39,TAAGTTCAATATGAAATAAA,,
4724, A1034360,,20,33,CAATATGAAATAAATCTATT,,
4725, A1034360,,20,27,GAAATAAATCTATTCTGCTA,,
65 4726, A1034360,,20,21,AATCTATTCTGCTACAACAA,,
4727, A1034360,,20,15,TTCTGCTACAACAACCAAAA,,
4728, A1034360,,20,9,TACAACAACCAAAAAA,,
4729, A1034360,,20,3,AACCAAAAAA,,
(GENBANK ACCESSION NO. AA465687)
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TCAAATGTACAGTTCAAAAAATGCTTTTGGCGTTTAAACAACAGTCTAGGAAAGAAAAGTACAGAGTTATCTTGAACCGGACAAA
TAAGTTACCACTGGCAAGTCTGTGGCCTAGTAAAAAATAAAAAATTAACCTCTTGTATCATATAGATATCTCTATGAAATC
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75 (SEQ ID NO: 4730)

4731,AA465687,,20,348,ACATAAAAAAAAAAAAAATCA,,
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5 4734,AA465687,,20,330,CAGTTAAACATCACATAGTA,,
4735,AA465687,,20,324,AACATCACATAGTAGACAGC,,
4736,AA465687,,20,318,ACATAGTAGACAGCCATTAA,,
4737,AA465687,,20,312,TAGACAGCCATTAAATTATA,,
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10 4739,AA465687,,20,300,AAATTATAAAAAAAATTAATT,,
4740,AA465687,,20,294,TAAAAAAATTAATTTATGAA,,
4741,AA465687,,20,288,AATTAATTTATGAAGAAAGA,,
4742,AA465687,,20,282,TTTATGAAGAAAGACCTTTT,,
4743,AA465687,,20,276,AAGAAAGACCTTTTGTACAG,,
15 4744,AA465687,,20,270,GACCTTTTGTACAGATTGAA,,
4745,AA465687,,20,264,TTGTACAGATTGAAAAAAA,,
4746,AA465687,,20,258,AGATTGAAAAAAAAGATTT,,
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4750,AA465687,,20,234,AGAGATATCTATATGATCAA,,
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4752,AA465687,,20,222,ATGATCAAGAGAGTTAATTT,,
4753,AA465687,,20,216,AAGAGAGTTAATTTTATT,,
25 4754,AA465687,,20,210,GTAAATTTTATTTTGT,,
4755,AA465687,,20,204,TTTTTATTTTGTTTTACTA,,
4756,AA465687,,20,198,TTTTTGTTTTACTAGTGCCA,,
4757,AA465687,,20,192,TTTTACTAGTGCCACAGACT,,
4758,AA465687,,20,186,TAGTGCCACAGACTTGCCAG,,
30 4759,AA465687,,20,180,CACAGACTTGCCAGTGGTAA,,
4760,AA465687,,20,174,CTTGCCAGTGGTAACTTATT,,
4761,AA465687,,20,168,AGTGGTAACTTATTGTCCG,,
4762,AA465687,,20,162,AACTTATTTGTCCGGTTCAA,,
4763,AA465687,,20,156,TTGTCCGGTTCAAGATAAC,,
35 4764,AA465687,,20,150,CGGTTCAAGATAACTCTGTA,,
4765,AA465687,,20,144,AAGATAACTCTGTAGTTTTC,,
4766,AA465687,,20,138,ACTCTGTAGTTTCTTTCCT,,
4767,AA465687,,20,132,TAGTTTCTTTCCTAGGACT,,
4768,AA465687,,20,126,CTTTCCTAGGACTTGTGT,,
40 4769,AA465687,,20,120,CTAGGACTTGTGTAAACG,,
4770,AA465687,,20,114,CTGTGTGTTAAACGCCAAA,,
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4773,AA465687,,20,96,AAGACATTTTGAAGTGTAC,,
45 4774,AA465687,,20,90,TTTTGAAGTGTACATTTGA,,
4775,AA465687,,20,84,AACTGTACATTTGATCAGAT,,
4776,AA465687,,20,78,ACATTTGATCAGATTGTTAG,,
4777,AA465687,,20,72,GATCAGATTGTTAGCTTTTC,,
4778,AA465687,,20,66,ATTGTTAGCTTTTCTGTTT,,
50 4779,AA465687,,20,60,AGCTTTTCTGTTTATTTC,,
4780,AA465687,,20,54,TCTGTTTATTCTTTTGAG,,
4781,AA465687,,20,48,TTATTTCTTTTGAGAACCTT,,
4782,AA465687,,20,42,CTTTTGAGAACCTTTGAATA,,
4783,AA465687,,20,36,AGAACCTTTGAATAAAAAAC,,
55 4784,AA465687,,20,30,TTTGAATAAAAAACATCTGA,,
4785,AA465687,,20,24,TAAAAACATCTGAAATTTT,,
4786,AA465687,,20,18,ACATCTGAAATTTTAAAAAA,,
4787,AA465687,,20,12,GAAATTTTAAAAAAA,,
4788,AA465687,,20,6,TTAAAAAAA,,
60 (GENBANK ACCESSION NO. AI085559)
TCGAGACAGACAACCTCAAAATAAGGTCCAAATATTGGTTCCTTCAAAATGGTGTCAAAAAGAATAGTATTATATGAGGAGGATAGT
TATCACAGAAATAAGAACTAAAAATCCCATTTTTTTTTTAAAGGAAAAAGACCTTCGATGATGCAGGTGTCTGTGTATAAGGAACTA
TGACCTACCAAAAAAACCAACACATAAGGAGAGGCCAATATAATTTGCCAGTCTGACAAGACAGTTGGTATTATAAGTGGAAGAGA
CTTCAAGGATCACATAATTAGCTCTTTGATTTTACAGGGAGGAAAGACGAGGCCAGAGATGGGAAGTGCTTGCCTAAAGTACAT
65 TAGCAAGTTAGCTTCAATGGTTATTTTTATACACACACAGGCACACATACATACTG
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4790,AI085559,,20,382,CAGTATGTATGTGTGCCTGT,,
4791,AI085559,,20,376,GTATGTGTGCCTGTGTGT,,
70 4792,AI085559,,20,370,GTGCCTGTGTGTATAAAA,,
4793,AI085559,,20,364,GTGTGTGTATAAAAAAACC,,
4794,AI085559,,20,358,GTATAAAAAAACCATTGAA,,
4795,AI085559,,20,352,AAATAACCAATTGAAGCTAAC,,
4796,AI085559,,20,346,CCATTGAAGCTAACTTGCTA,,
75 4797,AI085559,,20,340,AAGCTAACTTGCTAATGTAC,,

4798, AI085559,,20,334,ACTTGCTAATGTACTTAGGC,,
4799, AI085559,,20,328,TAATGTACTTAGGCAAGCCA,,
4800, AI085559,,20,322,ACTTAGGCAAGCCACTTCCC,,
4801, AI085559,,20,316,GCAAGCCACTTCCCCTCTCT,,
5 4802, AI085559,,20,310,CACTTCCCCTCTCTGGGCCT,,
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4804, AI085559,,20,298,CTGGGCCTCGTCTTTCCTCC,,
4805, AI085559,,20,292,CTCGTCTTTCCTCCCTCTAA,,
4806, AI085559,,20,286,TTTCCTCCCTCTAAAATCAA,,
10 4807, AI085559,,20,280,CCCTCTAAAATCAAAGAGCT,,
4808, AI085559,,20,274,AAAATCAAAGAGCTGAATTA,,
4809, AI085559,,20,268,AAAGAGCTGAATTATGTGAT,,
4810, AI085559,,20,262,CTGAATTATGTGATCCTTGA,,
4811, AI085559,,20,256,TATGTGATCCTTGAAGTCTC,,
15 4812, AI085559,,20,250,ATCCTTGAAGTCTCTTCCAC,,
4813, AI085559,,20,244,GAAGTCTCTTCCACTTATAA,,
4814, AI085559,,20,238,TCTTCCACTTATAATACCAA,,
4815, AI085559,,20,232,ACTTATAATACCAACTGTCT,,
4816, AI085559,,20,226,AATACCAACTGTCTTGTGAG,,
20 4817, AI085559,,20,220,AACTGTCTTGTGAGACTGGC,,
4818, AI085559,,20,214,CTTGTGAGACTGGCAAATTA,,
4819, AI085559,,20,208,AGACTGCAAAATTATATTGG,,
4820, AI085559,,20,202,GCAAAATTATATTGGCCTCTC,,
4821, AI085559,,20,196,TATATTGGCCTCTCCTTATG,,
25 4822, AI085559,,20,190,GGCCTCTCCTTATGTGGTGG,,
4823, AI085559,,20,184,TCCTTATGTGGTGGTTTTT,,
4824, AI085559,,20,178,TGTGGTGGTTTTTTGGTAG,,
4825, AI085559,,20,172,GGTTTTTTTGGTAGGTCATA,,
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4828, AI085559,,20,154,TAGTTCCTTATACACAGACA,,
4829, AI085559,,20,148,CTTATACACAGACACCTGCA,,
4830, AI085559,,20,142,CACAGACACCTGCATCATCG,,
4831, AI085559,,20,136,CACCTGCATCATCGAAGGTC,,
35 4832, AI085559,,20,130,CATCATCGAAGGTCCTTTTTT,,
4833, AI085559,,20,124,CGAAGGTCCTTTTTTCTCTAA,,
4834, AI085559,,20,118,TCCTTTTTTCTCTAAAAAAA,,
4835, AI085559,,20,112,TTTCTCTAAAAAAAATG,,
4836, AI085559,,20,106,AAAAAAAATGGGATTT,,
40 4837, AI085559,,20,100,AAAAAATGGGATTTTAGTTC,,
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4839, AI085559,,20,88,TTAGTTCCTTATCTGTGAT,,
4840, AI085559,,20,82,TCTTATCTGTGATAACTAT,,
4841, AI085559,,20,76,TCTGTGATAACTATCCTCCT,,
45 4842, AI085559,,20,70,ATAACTATCCTCCTCATATA,,
4843, AI085559,,20,64,ATCCTCCTCATATAATACTA,,
4844, AI085559,,20,58,CTCATATAATACTATTCTTT,,
4845, AI085559,,20,52,TAATACTATTCTTTTGACA,,
4846, AI085559,,20,46,TATTCTTTTGACACCATTT,,
50 4847, AI085559,,20,40,TTTGTGACCATTTGAAGGA,,
4848, AI085559,,20,34,CACCATTTGAAGGAACCAAT,,
4849, AI085559,,20,28,TTGAAGGAACCAATTTTGG,,
4850, AI085559,,20,22,GAACCAATTTTGGACCTTA,,
4851, AI085559,,20,16,ATATTTGGACCTTATTTTGA,,
55 4852, AI085559,,20,10,GGACCTTATTTGAGGTTGT,,
4853, AI085559,,20,4,TATTTGAGGTTGTCTGTCT,,
(GENBANK ACCESSION NO. AI654215)
TTTTTTTTTTTTTTTTTTTTTTTGTATGTTTCCAGTACCACCTTCAGCCTTGCCGGCTGCGTAAACTTTTGCTGTATCGAAAAGGTT
GATGCCATTATCATAGGCCAAGGTCATGAGCTGCTCTGCCATCTCATCGGTGATCTGGCCTCCGAAAGGTACCCATGTTCCAAAGTCC
60 CAGGCAGGAAACCCGAGGCCAAACTTGCCAGGTTCTGTAAATCATCCGGGGAGCCCGTCTGCCGAGCGAGACCGAGCCG
GGGAGCCCGTCTGTGATTTCTGGATACATGGAGCCAGCCTCACTTATCCAGACTTGTCTCGGTTTTTACAGGGGGAAAAATCTGCTCC
TGAACGGGAACGACCGGAGACAAGGCCATTTCCGAGCACTCAGGGGAACGCCAGGTCAC
(SEQ ID NO: 4854)
65 4855, AI654215,,20,391,GTGACCTGGCGTTCCCTGA,,
4856, AI654215,,20,385,TGGCGTTCCCTGAGTGCTC,,
4857, AI654215,,20,379,TCCCTGAGTGCTCGGAAAA,,
4858, AI654215,,20,373,GAGTGCTCGGAAAAATGGCCT,,
4859, AI654215,,20,367,TCGAAAAATGGCCTTGTCTC,,
70 4860, AI654215,,20,361,AAATGGCCTTGTCTCCGGTCG,,
4861, AI654215,,20,355,CTTGTCTCCGGTCTGTCCCG,,
4862, AI654215,,20,349,TCCGGTCTGTCCCGTTCAGG,,
4863, AI654215,,20,343,CGTTCCCGTTCAGGAGCAGA,,
4864, AI654215,,20,337,CGTTCAGGAGCAGAATTTTC,,
75 4865, AI654215,,20,331,GGAGCAGAATTTTCCCTCG,,

4866, A1654215,,20,325,GAATTTTCCCCTGTAAAAA,,
4867, A1654215,,20,319,TCCCCCTGTAAAAAACCGAG,,
4868, A1654215,,20,313,TGTAAAAAACCGAGCAAGTC,,
4869, A1654215,,20,307,AAACCGAGCAAGTCTGGATA,,
5 4870, A1654215,,20,301,AGCAAGTCTGGATAAGTGAG,,
4871, A1654215,,20,295,TCTGGATAAGTGAGGCTGGC,,
4872, A1654215,,20,289,TAAGTGAGGCTGGCTCCATG,,
4873, A1654215,,20,283,AGGCTGGCTCCATGTATCCA,,
4874, A1654215,,20,277,GCTCCATGTATCCAGAATCA,,
10 4875, A1654215,,20,271,TGTATCCAGAATCAACGACG,,
4876, A1654215,,20,265,CAGAATCAACGACGGGCTCC,,
4877, A1654215,,20,259,CAACGACGGGCTCCCCGGCT,,
4878, A1654215,,20,253,CGGGCTCCCCGGCTCGGCTC,,
4879, A1654215,,20,247,CCCCGGCTCGGCTCTCGCTG,,
15 4880, A1654215,,20,241,CTCGGCTCTCGCTGCGGCAG,,
4881, A1654215,,20,235,TCTCGCTGCGGCAGACGGGC,,
4882, A1654215,,20,229,TGCGGCAGACGGGCTCCCC,,
4883, A1654215,,20,223,AGACGGGCTCCCCGGGATG,,
4884, A1654215,,20,217,GCTCCCCGGGATGATTAC,,
20 4885, A1654215,,20,211,CCGGGATGATTTACAGGAAC,,
4886, A1654215,,20,205,TGATTTACAGGAACCTGGGC,,
4887, A1654215,,20,199,ACAGGAACCTGGGCAAGTTT,,
4888, A1654215,,20,193,ACCTGGGCAAGTTTGGCCTG,,
4889, A1654215,,20,187,GCAAGTTTGGCCTGCGGTTT,,
25 4890, A1654215,,20,181,TTGGCCTGCGGTTTCTCTGC,,
4891, A1654215,,20,175,TGCGGTTTCTCTGCCTGGGA,,
4892, A1654215,,20,169,TTTCTGCTGGGACTTGGA,,
4893, A1654215,,20,163,GCCTGGGACTTGGAACATGG,,
4894, A1654215,,20,157,GACTTGGAACATGGGTGACC,,
30 4895, A1654215,,20,151,GAACATGGGTGACCTTCGGA,,
4896, A1654215,,20,145,GGGTGACCTTCGGAGGCCAG,,
4897, A1654215,,20,139,CCTTCGGAGGCCAGATCACC,,
4898, A1654215,,20,133,GAGGCCAGATCACCAGATGAG,,
4899, A1654215,,20,127,AGATCACCAGATGAGATGGCA,,
35 4900, A1654215,,20,121,CCGATGAGATGGCAGAGCA,,
4901, A1654215,,20,115,AGATGGCAGAGCAGCTCATG,,
4902, A1654215,,20,109,CAGAGCAGCTCATGACCTTG,,
4903, A1654215,,20,103,AGCTCATGACCTTGGCCTAT,,
4904, A1654215,,20,97,TGACCTTGGCCTATGATAAT,,
40 4905, A1654215,,20,91,TGGCCTATGATAATGGCATC,,
4906, A1654215,,20,85,ATGATAATGGCATCAACCTT,,
4907, A1654215,,20,79,ATGGCATCAACCTTTTCGAT,,
4908, A1654215,,20,73,TCAACCTTTTCGATACAGCA,,
4909, A1654215,,20,67,TTTTCGATACAGCAAAAGTT,,
45 4910, A1654215,,20,61,ATACAGCAAAAGTTTACGCA,,
4911, A1654215,,20,55,CAAAAGTTTACGCAGCCGGC,,
4912, A1654215,,20,49,TTTACGCAGCCGGCAAGGCT,,
4913, A1654215,,20,43,CAGCCGGCAAGGCTGAAGTG,,
4914, A1654215,,20,37,GCAAGGCTGAAGTGTTACTG,,
50 4915, A1654215,,20,31,CTGAAGTGGTACTGGGAAAC,,
4916, A1654215,,20,25,TGGTACTGGGAAACATCAAA,,
4917, A1654215,,20,19,TGGGAAACATCAAAAAAAA,,
4918, A1654215,,20,13,ACATCAAAAAAAAANAA,,
4919, A1654215,,20,7,AAAAAAAANAA,,
55 4920, A1654215,,20,1,AAAAAAAANAA,,
(GENBANK ACCESSION NO. AA505075)
TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTAAATAACAACAAATGTATTAAAAACAGACTTCTCCAGTTGGCATTTTGAAT
GAAATTGCTAACAACTCCAACCTCTATATTGTGTTCTTTTGCTCCTGGAGTCCTTGCAGCTTAATTTCTTGAAACTCAGGCGGC
(SEQ ID NO: 4921)
60 4922, AA505075,,20,159,GCCGCCTGAGTTTCAAGAAT,,
4923, AA505075,,20,153,TGAGTTTCAAGAATTAAGC,,
4924, AA505075,,20,147,TCAAGAATTAAGCTGCAAG,,
4925, AA505075,,20,141,ATTAAAGCTGCAAGAGGACT,,
65 4926, AA505075,,20,135,GCTGCAAGAGGACTCCAGGA,,
4927, AA505075,,20,129,AGAGGACTCCAGGAGCAAAA,,
4928, AA505075,,20,123,CTCCAGGAGCAAAAGAAACA,,
4929, AA505075,,20,117,GAGCAAAAGAAACACAATAT,,
4930, AA505075,,20,111,AAGAAACACAATATAGAGGG,,
70 4931, AA505075,,20,105,CACAATATAGAGGGTTGGAG,,
4932, AA505075,,20,99,ATAGAGGGTTGGAGTTGTTA,,
4933, AA505075,,20,93,GGTTGGAGTTGTTAGCAATT,,
4934, AA505075,,20,87,AGTTGTTAGCAATTTCAATC,,
4935, AA505075,,20,81,TAGCAATTTCAATCAAAATG,,
75 4936, AA505075,,20,75,TTTCATTCAAAATGCCAACT,,

4937,AA505075,,20,69,TCAAAATGCCAACTGGAGAA,,
4938,AA505075,,20,63,TGCCAACTGGAGAAGTCTGT,,
4939,AA505075,,20,57,CTGGAGAAGTCTGTTTTAA,,
4940,AA505075,,20,51,AAGTCTGTTTTTAAATACAT,,
5 4941,AA505075,,20,45,GTTTTTAAATACATTTTGT,,
4942,AA505075,,20,39,AAATACATTTTGTGTTATT,,
4943,AA505075,,20,33,ATTTGTGTTATTTTTAAAA,,
4944,AA505075,,20,27,TTGTTATTTTAAAAAAAAAA,,
4945,AA505075,,20,21,TTTTAAAAAAAAAAAAAAAAAA,,
10 4946,AA505075,,20,15,AAAAAAAAAAAAAAAAAAAA,,
4947,AA505075,,20,9,AAAAAAAAAAAAAAAAAAAA,,
4948,AA505075,,20,3,AAAAAAAAAAAAAAAAAAAA,,
(GENBANK ACCESSION NO. AA906703)
TGAATTATGACAGAAATCTTTATTAATAATGTGTCTTTTCAGTAATATGTTTAGCATTCAATATACACACATACATATGTACTCTTTG
15 ACACGCCTCATGGATTGCTGCCATCAGTTAACTAATAAATTAATACTAAAAAGAGGGATGTGAGGGGAGGGGAACTAACGGCAAA
CTTTTCATGTTTATCTGGTAAGAAATTTGTGAATTTCTCAGAAATTTCCCTGGGCAAAACCTGTGACCAGAGAATCTGTGAAATAAA
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CATTCACCTTACATCTCTGGCT
(SEQ ID NO: 4949)
20 4950,AA906703,,20,350,AGCCAGAGTATGAAGTGGA,,
4951,AA906703,,20,344,AGTATGAAGTGAATGAATG,,
4952,AA906703,,20,338,AAGTGAATGAATGCTCCTG,,
4953,AA906703,,20,332,AAATGAATGCTCCTGTCTGA,,
25 4954,AA906703,,20,326,TGCTCCTGTCTGAGAAGCA,,
4955,AA906703,,20,320,TGTTCTGAGAAGCACACTTG,,
4956,AA906703,,20,314,GAGAAGCACACTTGTAAC TG,,
4957,AA906703,,20,308,CACACTTGTAAC TGCACTCT,,
4958,AA906703,,20,302,TGTAAC TGCACTCTTTGGAA,,
30 4959,AA906703,,20,296,TGCATCTTTGGAAATTTT,,
4960,AA906703,,20,290,TTTGGAAATTTTTTTTTT,,
4961,AA906703,,20,284,AAATTTTTTTTTTTTTTC,,
4962,AA906703,,20,278,TTTTTTTTTTTCCAAGGG,,
4963,AA906703,,20,272,TTTTTTTCCAAGGGGTAGAG,,
35 4964,AA906703,,20,266,TCCAAGGGGTAGAGATTTAT,,
4965,AA906703,,20,260,GGGTAGAGATTTATGTATT,,
4966,AA906703,,20,254,AGATTTATGTATTTTATTC,,
4967,AA906703,,20,248,ATGTATTTTATTTACAGAT,,
4968,AA906703,,20,242,TTTATTTACAGATTTCTCTG,,
40 4969,AA906703,,20,236,TCACAGATTTCTCTGGTCACA,,
4970,AA906703,,20,230,ATTCTCTGGTCACAGTTT,,
4971,AA906703,,20,224,TGGTCACAGTTTGTGCCA,,
4972,AA906703,,20,218,CAGGTTTTTGCCAGGGAAA,,
4973,AA906703,,20,212,TTTGCCAGGGAAATTTCTGA,,
45 4974,AA906703,,20,206,CAGGGAATTTCTGAGAAATT,,
4975,AA906703,,20,200,AATTTCTGAGAAATTCACAAT,,
4976,AA906703,,20,194,GAGAAATTCACAATTTCTTA,,
4977,AA906703,,20,188,TTCAATTTCTTACCAGAT,,
4978,AA906703,,20,182,ATTTCTTACCAGATAAAACA,,
50 4979,AA906703,,20,176,TACCAGATAAAACATGAAAA,,
4980,AA906703,,20,170,ATAAAACATGAAAAGTTTGC,,
4981,AA906703,,20,164,CATGAAAAGTTTGCCGTTAG,,
4982,AA906703,,20,158,AAGTTTGCCGTTAGTTCCCC,,
4983,AA906703,,20,152,GCCGTTAGTTCCCTCCCT,,
55 4984,AA906703,,20,146,AGTTCCCTCCCTCACATC,,
4985,AA906703,,20,140,CCTCCCTCACATCCCTCTT,,
4986,AA906703,,20,134,CTCACATCCCTCTTTTAGT,,
4987,AA906703,,20,128,TCCCTCTTTTAGTTTAAAT,,
4988,AA906703,,20,122,TTTTAGTTTAAATTTATTA,,
60 4989,AA906703,,20,116,GTTTTAAATTTATAGTTAAA,,
4990,AA906703,,20,110,ATTTATAGTTAAACTGATG,,
4991,AA906703,,20,104,TAGTTAACTGATGGCAGCA,,
4992,AA906703,,20,98,AACTGATGGCAGCAATCCAT,,
4993,AA906703,,20,92,TGGCAGCAATCCATGAGGCG,,
65 4994,AA906703,,20,86,CAATCCATGAGGCGTGCTAA,,
4995,AA906703,,20,80,ATGAGGCGTGCTAAAGAGTG,,
4996,AA906703,,20,74,CGTGTCAAAGAGGTACATA,,
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4998,AA906703,,20,62,TGTACATATGTATGTGTGA,,
70 4999,AA906703,,20,56,TATGTATGTGTATATTGA,,
5000,AA906703,,20,50,TGTGTATATTTGAATGCTA,,
5001,AA906703,,20,44,TATATTGAATGCTAAACATA,,
5002,AA906703,,20,38,GAATGCTAAACATATTACTG,,
5003,AA906703,,20,32,TAAACATATTACTGAAAGAC,,
75 5004,AA906703,,20,26,TATTACTGAAAGACACATTT,,

5005,AA906703,,20,20,TGAAAGACACATTTTAATAA,,
5006,AA906703,,20,14,ACACATTTTAATAAAGATTT,,
5007,AA906703,,20,8,TTTAATAAAGATTTCTGTCA,,
5008,AA906703,,20,2,AAAGATTTCTGTCATAATTC,,
5 (GENBANK ACCESSION NO. AI369870)
GGCCCCGGGGAGCGCGGCGCAATTCGTCGCGCCCGCGGGGGGGCGGCTCCCGGCATCTTCGCGGCGACCAAGGACTACCAGGAA
GGGGAGCGGCTGGGATGGCGCGTCCGCGGCCCGCGAGTACAAAGCGGGCGACCTGGTCTTCGCCAAGATGAAGGGCTACCCGCA
CTGGCCGGCCCGGATTGATGAACTCCAGAGGGCGCTGTGAAGCCTCCAGCAAACAAGTATCCTATCTTCTTTTTGGCACCCATGA
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10 ACGAAGGATTGTGGGAAATAGAAAATAACCCAGGAGTAAAGTTTACTGGCTACCAGGCAATTCAGCAACAGAGCTCTTCAGAAACT
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(SEQ ID NO: 5009)

5010,AI369870,,20,448,TCACTGCTTGCACTGCACTG,,
15 5011,AI369870,,20,442,CTTGCACTGCACTGATTTTC,,
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5013,AI369870,,20,430,GTATTTCCACCTTCTCCCTC,,
5014,AI369870,,20,424,CCACCTTCTCCCTCAGTTTC,,
5015,AI369870,,20,418,TCTCCCTCAGTTTCTGAAGA,,
20 5016,AI369870,,20,412,TCAGTTTCTGAAGAGCTCTG,,
5017,AI369870,,20,406,TCTGAAGAGCTCTGTGCTG,,
5018,AI369870,,20,400,GAGCTCTGTGCTGAATTGC,,
5019,AI369870,,20,394,TGTTGCTGAATTGCCTGGTA,,
5020,AI369870,,20,388,TGAATTGCCTGGTAGCCAGT,,
25 5021,AI369870,,20,382,GCCTGGTAGCCAGTAAACTT,,
5022,AI369870,,20,376,TAGCCAGTAAACTTTACTCC,,
5023,AI369870,,20,370,GTAACTTTACTCCTGGGTT,,
5024,AI369870,,20,364,TTTACTCCTGGGTTATTTTC,,
5025,AI369870,,20,358,CCTGGGTTATTTTCTATTTTC,,
30 5026,AI369870,,20,352,TTATTTTCTATTTCCACAA,,
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5028,AI369870,,20,340,TCCCACAATCCTTCGTTAAA,,
5029,AI369870,,20,334,AATCCTTCGTTAAATCCTTT,,
5030,AI369870,,20,328,TCGTTAAATCCTTTCCGTTT,,
35 5031,AI369870,,20,322,AATCCTTTCCGTTTGTGTA,,
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40 5036,AI369870,,20,292,TTGTCTTTGTACTCCTTATA,,
5037,AI369870,,20,286,TTGTACTCCTTATATGGAAG,,
5038,AI369870,,20,280,TCCTTATATGGAAGAAAGGTC,,
5039,AI369870,,20,274,TATGGAAGAAAGGTCTTTGGG,,
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45 5041,AI369870,,20,262,TCCTTGGGACCTAGAAATGC,,
5042,AI369870,,20,256,GGACCTAGAAATGCAGTTTC,,
5043,AI369870,,20,250,AGAAATGCAGTTTCATGGGT,,
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5045,AI369870,,20,238,TCATGGGTGCCAAAAAGAA,,
50 5046,AI369870,,20,232,GTGCCAAAAAGAGATAGG,,
5047,AI369870,,20,226,AAAAAGAGATAGGATACTT,,
5048,AI369870,,20,220,AAGATAGGATACTTGTGTC,,
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55 5051,AI369870,,20,202,GCTGGAGGCTTCACAGCGCC,,
5052,AI369870,,20,196,GGCTTCACAGCGCCCTCTGG,,
5053,AI369870,,20,190,ACAGCGCCCTCTGGGAGTTC,,
5054,AI369870,,20,184,CCCTCTGGGAGTTCATCAAT,,
5055,AI369870,,20,178,GGGAGTTCATCAATCCGGGC,,
60 5056,AI369870,,20,172,TCATCAATCCGGGCCGGCCA,,
5057,AI369870,,20,166,ATCCGGGCCGGCCAGTGGCG,,
5058,AI369870,,20,160,GCCGGCCAGTGGGGTAGCC,,
5059,AI369870,,20,154,CAGTGGGGTAGCCCTTCAT,,
5060,AI369870,,20,148,GGGTAGCCCTTCATCTTGGC,,
65 5061,AI369870,,20,142,CCCTTCATCTTGGCGAAGAC,,
5062,AI369870,,20,136,ATCTTGGCGAAGACCAAGTC,,
5063,AI369870,,20,130,GCGAAGACCAAGTCGCCCGC,,
5064,AI369870,,20,124,ACCAGGTGCGCCGCTTTGTA,,
5065,AI369870,,20,118,TCGCCCGCTTTGACTCGCG,,
70 5066,AI369870,,20,112,GCTTTGTACTCGCGGGGCCG,,
5067,AI369870,,20,106,TACTCGCGGGGCCGCGACG,,
5068,AI369870,,20,100,CGGGGCCGCGGACGCGCCAT,,
5069,AI369870,,20,94,CGCGGACGCGCCATCCAGC,,
5070,AI369870,,20,88,CGCGCCATCCCAAGCCGCTCC,,
75 5071,AI369870,,20,82,ATCCCAAGCCGCTCCCTTCC,,

5072, AI369870,,20,76, GCCGCTCCCTTCTGGTAG,,
5073, AI369870,,20,70, CCCCCTCCTGGTAGTCCTTG,,
5074, AI369870,,20,64, CCTGGTAGTCCTTGGTCGCC,,
5075, AI369870,,20,58, AGTCCTTGGTCGCCGGAAG,,
5 5076, AI369870,,20,52, TGGTCGCCGGAAGATGCCG,,
5077, AI369870,,20,46, CCGCGAAGATGCCGGAGGC,,
5078, AI369870,,20,40, AGATGCCGGGAGGCCGCCCG,,
5079, AI369870,,20,34, CGGGAGGCCGCCGCCCGCG,,
5080, AI369870,,20,28, GCCGCCGCCGCCGGGCCGA,,
10 5081, AI369870,,20,22, CCCCCGCGGCCGACGAATT,,
5082, AI369870,,20,16, CGGGCCGACGAATTGCGCCG,,
5083, AI369870,,20,10, GACGAATTGCGCCGCGCTCC,,
5084, AI369870,,20,4, TTGCGCCGCGCTCCCGCGG,,
(GENBANK ACCESSION NO. AA463249)
15 TTTTTTTTTTTTTTTTTTCTCAAGAAAAAGTTTAAATAGCAAGGAGTTTCCATCAGTCCCGGTCTTTGTGAGGATTACCACAACA
AACACTTAAAGGATACAACAGGTACTTATTAATAGTGCCTTGCCCTTTTACCTCTTCTTTTTTTTTTTTGTAGATGGAGTCTCG
CTCTGCTGCCAGCCTGAAGTGACAGTGGTGTGATCTCGGCTCACTGCACACCTCCGCTTCCAGGTTAGGTGAITCTCTTGCCTCGGC
CTCCCGAGTAGCTGGGATGGAATACAGGCACATGTACCATGCCAGCTAATTTTTGTATTTTATGTA
(SEQ ID NO: 5085)
20 5086, AA463249,,20,315, TACTAAAAATACAAAAAATT,,
5087, AA463249,,20,309, AAATACAAAAAATTAGCTGG,,
5088, AA463249,,20,303, AAAAAATTAGCTGGGCATGG,,
5089, AA463249,,20,297, TTAGCTGGGCATGGTGACAT,,
25 5090, AA463249,,20,291, GGGCATGGTGACATGTGCCT,,
5091, AA463249,,20,285, GGTGACATGTGCCTGTAGTC,,
5092, AA463249,,20,279, ATGTGCCTGTAGTCCATCCC,,
5093, AA463249,,20,273, CTGTAGTCCATCCCAGCTAC,,
5094, AA463249,,20,267, TCCATCCCAGCTACTCGGGA,,
30 5095, AA463249,,20,261, CCAGCTACTCGGGAGGCCGA,,
5096, AA463249,,20,255, ACTCGGGAGGCCGAGGCAAG,,
5097, AA463249,,20,249, GAGGCCGAGGCAAGAGAATC,,
5098, AA463249,,20,243, GAGGCAAGAGAATCACCTAA,,
5099, AA463249,,20,237, AGAGAATCACCTAAACCTGG,,
35 5100, AA463249,,20,231, TCACCTAAACCTGGAAGGCG,,
5101, AA463249,,20,225, AAACCTGGAAGGCGGAGGTT,,
5102, AA463249,,20,219, GGAAGGCGGAGGTTGCAGTG,,
5103, AA463249,,20,213, CGGAGGTTGCAGTGAGCCGA,,
5104, AA463249,,20,207, TTGCAGTGAGCCGAGATCAC,,
40 5105, AA463249,,20,201, TGAGCCGAGATCACACCACT,,
5106, AA463249,,20,195, GAGATCACACCACTGCACCT,,
5107, AA463249,,20,189, ACACCACTGCACCTCAGGCT,,
5108, AA463249,,20,183, CTGCACTTCAGGCTGGGCAG,,
5109, AA463249,,20,177, TTCAGGCTGGGCAGCAGAGC,,
45 5110, AA463249,,20,171, CTGGGCAGCAGAGCGAGACT,,
5111, AA463249,,20,165, AGCAGAGCGAGACTCCATCT,,
5112, AA463249,,20,159, GCGAGACTCCATCTCAAAAAA,,
5113, AA463249,,20,153, CTCCATCTCAAAAAA,,
5114, AA463249,,20,147, CTCAAAAA,,
50 5115, AA463249,,20,141, AAAAAAAGGAAGAGAG,,
5116, AA463249,,20,135, AAAAAAAGGAAGAGGTAAAA,,
5117, AA463249,,20,129, AGGAAGAGGTAAAAAGGCAAG,,
5118, AA463249,,20,123, AGGTAAAAAGGCAAGGCAGCA,,
5119, AA463249,,20,117, AAGGCAAGGCAGCATTTAAT,,
55 5120, AA463249,,20,111, AGGCAGCATTTAATAAGTAC,,
5121, AA463249,,20,105, CATTTAATAAGTACCTGTTG,,
5122, AA463249,,20,99, ATAAGTACCTGTTGTATCCT,,
5123, AA463249,,20,93, ACCTGTTGTATCCTTTAAG,,
5124, AA463249,,20,87, TGTATCCTTTAAGTGTGTTG,,
60 5125, AA463249,,20,81, CTTTAAAGTGTGTTGTGTTG,,
5126, AA463249,,20,75, AGTGTGTTGTGTTGTTAATCC,,
5127, AA463249,,20,69, TGTGTGTTAATCCTCACAA,,
5128, AA463249,,20,63, GGTAATCCTCACAAAGACCG,,
5129, AA463249,,20,57, CCTCACAAAGACCGGACTG,,
65 5130, AA463249,,20,51, AAAGACCGGACTGATGGAA,,
5131, AA463249,,20,45, CGGACTGATGGAAACTCCT,,
5132, AA463249,,20,39, TGATGGAAACTCCTTGCTAT,,
5133, AA463249,,20,33, AAACCTCTTGCTATTAACT,,
5134, AA463249,,20,27, CTTGCTATTAACTTTTTT,,
70 5135, AA463249,,20,21, ATTAACCTTTTTTCTTGAG,,
5136, AA463249,,20,15, CTTTTTTCTTGAGGAAAAA,,
5137, AA463249,,20,9, TTCTTGAGGAAAAA,,
5138, AA463249,,20,3, AGGAAAAA,,
(GENBANK ACCESSION NO. R38894)

TTTTTACAGCATAGCGGTTTATTCATGCCATCATACAGTCGATCTGTATTCTTCAAGTACATTTTGAATTTATAATGAAGACAGTTT
AAGGCATAACTCTTCCCACTCAAATCTATGGTCTTTCTCAAGTGAGACACTAGAGAGAAGTAGAANGGGAGGNTGAGATAGGGC
(SEQ ID NO: 5139)

- 5 5140,R38894,,20,152,GCCCTATCTCANCCTCCCNCT,,
5141,R38894,,20,146,TCTCANCCTCCCNCTTCTACT,,
5142,R38894,,20,140,CCTCCCNCTTCTACTCTCTCT,,
5143,R38894,,20,134,NTTCTACTCTCTCTAGTGTC,,
5144,R38894,,20,128,CTCTCTCTAGTGCTCTCACTT,,
10 5145,R38894,,20,122,CTAGTGCTCACTTGAGAAA,,
5146,R38894,,20,116,TCTCACTTGAGAAAAGACCAT,,
5147,R38894,,20,110,TTGAGAAAAGACCATAGATT,,
5148,R38894,,20,104,AAGACCATAGATTGAGTGG,,
5149,R38894,,20,98,ATAGATTGAGTGGGAAGAG,,
15 5150,R38894,,20,92,TTGAGTGGGAAGAGTTATGC,,
5151,R38894,,20,86,GGGAAGAGTTATGCCTTAAA,,
5152,R38894,,20,80,AGTTATGCCTTAACTGTCT,,
5153,R38894,,20,74,GCCTTAACTGTCTTCATTA,,
5154,R38894,,20,68,AACTGTCTTCATTATAAAAT,,
20 5155,R38894,,20,62,CTTCATTATAAAATCAAAT,,
5156,R38894,,20,56,TATAAAATCAAATGTACTT,,
5157,R38894,,20,50,TTCAAATGTACTTGAAGAA,,
5158,R38894,,20,44,ATGTACTTGAAGAATACAGA,,
5159,R38894,,20,38,TTGAAGAATACAGATCGACT,,
25 5160,R38894,,20,32,AATACAGATCGACTGTATGA,,
5161,R38894,,20,26,GATCGACTGTATGATGGCAT,,
5162,R38894,,20,20,CTGTATGATGGCATGAATAA,,
5163,R38894,,20,14,GATGGCATGAATAAACCGCT,,
5164,R38894,,20,8,ATGAATAAACCGCTATGCTG,,
30 5165,R38894,,20,2,AAACCGCTATGCTGTAAAAA,,
(GENBANK ACCESSION NO. R49144)
TTTTTTTTTTTTTTGGAGATGACCTGNACTTTTAAATGGCACAGCCCCAGCTCCAGCAAAGCAGCAAGACAGGAAGCTATGCAAAGC
TGCTCAGAGGTGCAAGTGGCCAAACAACCTCTAGGAGATCGCCTGTNTTCCCTCCCATCCCCAAGCTTATGACGTGGCTCCATGCCCA
GGGAACCTTTGGGCCANCCANCCCCANTCCCAAAACCTCATAATNCACAGAGGGAGCCTGGGCCAAG
(SEQ ID NO: 5166)

- 35 5167,R49144,,20,222,CTTGGCCCAGGCTCCCTCTG,,
5168,R49144,,20,216,CCAGGCTCCCTCTGTGNATT,,
5169,R49144,,20,210,TCCCTCTGTGNATTATGAGG,,
40 5170,R49144,,20,204,TGTGNATTATGAGGGTTTGG,,
5171,R49144,,20,198,TTATGAGGGTTTGGGANTGG,,
5172,R49144,,20,192,GGGTTTGGGANTGGGGNTGG,,
5173,R49144,,20,186,GGGANTGGGGNTGGGNTGGC,,
5174,R49144,,20,180,GGGGNTGGGNTGGCCAAAG,,
45 5175,R49144,,20,174,GGGNTGGCCAAAGTTCCCT,,
5176,R49144,,20,168,GCCCAAAGTTCCCTGGGCAT,,
5177,R49144,,20,162,AGTTCCCTGGGCATGGAGCC,,
5178,R49144,,20,156,CTGGGCATGGAGCCACGTCA,,
5179,R49144,,20,150,ATGGAGCCACGTCAAGCT,,
50 5180,R49144,,20,144,CCACGTCATAAGCTTGGGGG,,
5181,R49144,,20,138,CATAAGCTTGGGGGATGGGA,,
5182,R49144,,20,132,CTTGGGGGATGGGAGGGAAN,,
5183,R49144,,20,126,GGATGGGAGGGAANACAGGC,,
5184,R49144,,20,120,GAGGGAANACAGGCGATCTC,,
55 5185,R49144,,20,114,ANACAGGCGATCTCCTAGAG,,
5186,R49144,,20,108,GCGATCTCCTAGAGTTGTTT,,
5187,R49144,,20,102,TCCTAGAGTTGTTTGGCCAC,,
5188,R49144,,20,96,AGTTGTTTGGCCACTGCACC,,
5189,R49144,,20,90,TTGGCCACTGCACCTCTGAG,,
60 5190,R49144,,20,84,ACTGCACCTCTGAGCAGCTT,,
5191,R49144,,20,78,CCTCTGAGCAGCTTTGCATA,,
5192,R49144,,20,72,AGCAGCTTTGCATAGCTTCC,,
5193,R49144,,20,66,TTGCATAGCTTCTGTCTT,,
5194,R49144,,20,60,TAGCTTCTGTCTTGTCTGCT,,
65 5195,R49144,,20,54,CCTGTCTTGTCTTGTGCTG,,
5196,R49144,,20,48,TTGCTGCTTGTCTGGAGCTG,,
5197,R49144,,20,42,CTTGCTGGAGCTGGGGCTG,,
5198,R49144,,20,36,TGGAGCTGGGGCTGTGCCAT,,
5199,R49144,,20,30,TGGGGCTGTGCCATTAAG,,
70 5200,R49144,,20,24,TGTGCCATTAAGTNCAGG,,
5201,R49144,,20,18,ATTAAAGTNCAGGTCATCT,,
5202,R49144,,20,12,AGTNCAGGTCATCTCAAAA,,
5203,R49144,,20,6,GGTCATCTCAAAAAAAAAA,,
(GENBANK ACCESSION NO. AA398883)

TATGTCACTATTTTATTGATGATGTGTTTTATAGAATCACAAAATTTAGAAACATAAGAAGGATTAGGTATCACCTAAATTCAAAG
AAATGTGTGTTTCTAGGTTGCTAAATTCAAAGAAAAAGTATGATTTGGTTTGGTTTCATTTAAAAACAGGTCAAAAACAGAATTATATT
TCAAAATTTAGAAAGATACGGTATTAAAGTGATTCATCTTATTTTGGACATTTTTCTCAAGGAGAAATTTTCTGGAAAGAAAAAGTACATT
TATATGTGGGCTTATTAAGAGAAAGAGAGAAAGGCATGCTATTTTAAATCATTAAATTTCTTGATGATGACGATCATCATCAAGATGAG
5 AAAGAAAAGAAATATGAGCCAAGAGAAATCTGTGTGCCAGCAATCAGTTTACCAGAAACATCTGCAGGTGAACATTTTCCAAATGG
AGTGACAGACTAATTGCATCTACGGGGATGAGAAATCTGCCATAGAGAGGATGCTGTGGGCTTATTTTGCTTATGTAGATAGGAAGG
GTGATACATGGA
(SEQ ID NO: 5204)

10 5205,AA398883,,20,514,TCCATGTATCACCCCTTCCTA,,
5206,AA398883,,20,508,TATCACCCCTTCCTATCTACA,,
5207,AA398883,,20,502,CCTTCCTATCTACATAAGCA,,
5208,AA398883,,20,496,TATCTACATAAGCAAAATAA,,
5209,AA398883,,20,490,CATAAGCAAAATAAGCCAC,,
15 5210,AA398883,,20,484,CAAAATAAGCCACAGCATC,,
5211,AA398883,,20,478,AAGCCACAGCATCCTCTCT,,
5212,AA398883,,20,472,ACAGCATCCTCTCTATGGCA,,
5213,AA398883,,20,466,TCCTCTCTATGGCAGATTCT,,
5214,AA398883,,20,460,CTATGGCAGATTCTCATCCC,,
20 5215,AA398883,,20,454,CAGATTCTCATCCCCGTAGA,,
5216,AA398883,,20,448,CTCATCCCCGTAGATGCAAT,,
5217,AA398883,,20,442,CCCGTAGATGCAATTAAGTCT,,
5218,AA398883,,20,436,GATGCAATTAGTCTGTCACT,,
5219,AA398883,,20,430,ATTAGTCTGTCACTCCATTT,,
25 5220,AA398883,,20,424,CTGTCACTCCATTTGGAAAA,,
5221,AA398883,,20,418,CTCCATTTGGAAAAATGTTCA,,
5222,AA398883,,20,412,TTGAAAAATGTTTACCTGCA,,
5223,AA398883,,20,406,AATGTTTACCTGCAGATGTT,,
5224,AA398883,,20,400,CACCTGCAGATGTTCTGGTA,,
30 5225,AA398883,,20,394,CAGATGTTCTGGTAAACTGA,,
5226,AA398883,,20,388,TTCTGGTAAACTGATTGCTG,,
5227,AA398883,,20,382,TAAACTGATTGCTGGCAACA,,
5228,AA398883,,20,376,GATTGCTGGCAACAACAGAT,,
5229,AA398883,,20,370,TGGCAACAACAGATTCTCTT,,
35 5230,AA398883,,20,364,CAACAGATTCTCTGGCTCA,,
5231,AA398883,,20,358,ATTCTCTGGCTCATATTTCT,,
5232,AA398883,,20,352,TTGGCTCATATTTCTTTTCT,,
5233,AA398883,,20,346,CATATTTCTTTTCTTTCTCA,,
5234,AA398883,,20,340,TCTTTTCTTTCTCATCTTGA,,
40 5235,AA398883,,20,334,CTTTCTCATCTTGATGATGA,,
5236,AA398883,,20,328,CATCTTGATGATGATCGTCA,,
5237,AA398883,,20,322,GATGATGATCGTCATCATCA,,
5238,AA398883,,20,316,GATCGTCATCATCAAGAAAT,,
5239,AA398883,,20,310,CATCATCAAGAAATTAATGA,,
45 5240,AA398883,,20,304,CAAGAATTTAATGATTAAAA,,
5241,AA398883,,20,298,TTAATGATTAAAAATAGCAT,,
5242,AA398883,,20,292,GATTAATAATAGCATGCCTTT,,
5243,AA398883,,20,286,AATAGCATGCCITTTCTCTCT,,
5244,AA398883,,20,280,ATGCCTTTCTCTCTTTCTCT,,
50 5245,AA398883,,20,274,TTCTCTCTTTCTCTTAATAA,,
5246,AA398883,,20,268,CTTTCTCTTAATAAGCCAC,,
5247,AA398883,,20,262,CTTAATAAGCCACATATAA,,
5248,AA398883,,20,256,AAGCCACATATAAATGTAC,,
5249,AA398883,,20,250,ACATATAAATGTACTTTTCT,,
55 5250,AA398883,,20,244,AAATGTACTTTTCTTCCAG,,
5251,AA398883,,20,238,ACTTTTCTTCCAGAAAAAT,,
5252,AA398883,,20,232,TCTTCCAGAAAAATTTCTCCT,,
5253,AA398883,,20,226,AGAAAAATTTCTCCTTGAGGA,,
5254,AA398883,,20,220,ATTCTCCTTGAGGAAAAATG,,
60 5255,AA398883,,20,214,CTTGAGGAAAAATGTCCAAA,,
5256,AA398883,,20,208,GAAAAATGTCCAAAAATAAGA,,
5257,AA398883,,20,202,GTGCAAAATAAGATGAATC,,
5258,AA398883,,20,196,AAATAAGATGAATCACTTAA,,
5259,AA398883,,20,190,GATGAATCACTTAATACCGT,,
65 5260,AA398883,,20,184,TCACCTTAATACCGTATCTTC,,
5261,AA398883,,20,178,AAATACCGTATCTTCTAAAT,,
5262,AA398883,,20,172,GTATCTTCTAAATTTGAAAT,,
5263,AA398883,,20,166,TCTAAATTTGAAATATAATT,,
5264,AA398883,,20,160,TTGAAATATAATTCTGTTT,,
70 5265,AA398883,,20,154,ATATAATTCTGTTTGTGACC,,
5266,AA398883,,20,148,TTCTGTTTGTGACCTGTTTT,,
5267,AA398883,,20,142,TTGTGACCTGTTTTAAATGA,,
5268,AA398883,,20,136,CCTGTTTTAAATGAACCAAA,,
5269,AA398883,,20,130,TTAAATGAACCAAAACCAAT,,
75 5270,AA398883,,20,124,GAACCAAAACCAATCATACT,,

5271,AA398883,,20,118,AACCAAATCATACTTTTTCT,,
5272,AA398883,,20,112,ATCATACTTTTTCTTTGAAT,,
5273,AA398883,,20,106,CTTTTCTTTGAATTTAGCA,,
5274,AA398883,,20,100,CTTTGAATTTAGCAACCTAG,,
5 5275,AA398883,,20,94,ATTTAGCAACCTAGAAACAC,,
5276,AA398883,,20,88,CAACCTAGAAACACACATTT,,
5277,AA398883,,20,82,AGAAACACACATTTCTTTGA,,
5278,AA398883,,20,76,ACACATTTCTTTGAATTTAG,,
5279,AA398883,,20,70,TTCTTTGAATTTAGGTGATA,,
10 5280,AA398883,,20,64,GAATTTAGGTGATACCTAAA,,
5281,AA398883,,20,58,AGGTGATACCTAAATCCTTC,,
5282,AA398883,,20,52,TACCTAAATCCTTCTTATGT,,
5283,AA398883,,20,46,AATCCTTCTTATGTTTCTAA,,
5284,AA398883,,20,40,TCCTATGTTTCTAAATTTTG,,
15 5285,AA398883,,20,34,GTCTCTAAATTTTGATTC,,
5286,AA398883,,20,28,AAATTTTGATTTCTATAAA,,
5287,AA398883,,20,22,TGTGATTCTATAAAACACAT,,
5288,AA398883,,20,16,TCTATAAAACACATCATCA,,
5289,AA398883,,20,10,AAACACATCATCAATAAAAT,,
20 5290,AA398883,,20,4,ATCATCAATAAAATAGTGAC,,
(GENBANK ACCESSION NO. AA425700)
CACATTTTATTTAATCTTTTATTTGAATCAAGGGAACCCCTCATATGGAGAATAGAGACCCAAAGAACAGTTGGGATCAAGAGCTTAT
TTACTTTTAAAGAAATGATACATTTGTGGAAATTTGATCAAAATAAGAGCTTTAGGCTAAGGGCAGTAAATTTGTGGCATGACTAAG
AAATAGATGGTGGATGATGAGTGAAGATAAGGAGTATTTAGTAGATTTGTTGTACAGATCCATTTTCGTCTACTCTCCAGTCTC
25 CAGTAAGGATGTTCTCTCTCTGGAACAGAAGGGGCATTTCTCATGGGAAATTTGATTACCTGCTTTTAGGGAGACAGCAGGTCA
GGGAACCTTCTCTG
(SEQ ID NO: 5291)

5292,AA425700,,20,343,CAGGAAGGGTCCCTGACCT,,
30 5293,AA425700,,20,337,GGGTTCCTGACCTGCTGTCTC,,
5294,AA425700,,20,331,CCTGACCTGCTGTCTCCCTA,,
5295,AA425700,,20,325,CTGCTGTCTCCCTAAAAGCA,,
5296,AA425700,,20,319,TCTCCCTAAAAGCAGGTAAT,,
5297,AA425700,,20,313,TAAAAGCAGGTAATACAATT,,
35 5298,AA425700,,20,307,CAGGTAATACAATTTCCCAT,,
5299,AA425700,,20,301,ATACAATTTCCCATGAGAAA,,
5300,AA425700,,20,295,TTTCCCATGAGAAAAGTCCCC,,
5301,AA425700,,20,289,ATGAGAAAAGTCCCCCTCTG,,
5302,AA425700,,20,283,AAGTGCCCCCTTCTGTTCCAG,,
40 5303,AA425700,,20,277,CCCTTCTGTTCCAGAAGAGA,,
5304,AA425700,,20,271,TGTTCCAGAAGAGAAGACA,,
5305,AA425700,,20,265,AGAAGAGAAGAACATCCTTA,,
5306,AA425700,,20,259,GAAGAACATCCTTACTGGAG,,
5307,AA425700,,20,253,CATCCTTACTGGAGACTGGG,,
45 5308,AA425700,,20,247,TACTGGAGACTGGGAGTAGA,,
5309,AA425700,,20,241,AGACTGGGAGTAGATGACGA,,
5310,AA425700,,20,235,GGAGTAGATGACGAAATGGA,,
5311,AA425700,,20,229,GATGACGAAATGGATCTGTA,,
5312,AA425700,,20,223,GAAATGGATCTGTACAAACA,,
50 5313,AA425700,,20,217,GATCTGTACAAACAAATCTA,,
5314,AA425700,,20,211,TACAAACAAATCTACTGAAA,,
5315,AA425700,,20,205,CAAATCTACTGAAATACTCC,,
5316,AA425700,,20,199,TACTGAAATACTCCTTATCT,,
5317,AA425700,,20,193,AAATACTCCTTATCTTCCACT,,
55 5318,AA425700,,20,187,CCTTATCTTCCACTCATATC,,
5319,AA425700,,20,181,CTTCCACTCATATCCACCAT,,
5320,AA425700,,20,175,CTCATATCCACCATCTATTT,,
5321,AA425700,,20,169,TCCACCATCTATTTCTTAGT,,
5322,AA425700,,20,163,ATCTATTTCTTAGTCATGCC,,
60 5323,AA425700,,20,157,TTCTTAGTCATGCCACAATT,,
5324,AA425700,,20,151,GTCTAGTCATGCCACAATT,,
5325,AA425700,,20,145,CCACAATTTACTGCCCTTAG,,
5326,AA425700,,20,139,TTTACTGCCCTTAGCCTAAA,,
5327,AA425700,,20,133,GCCTTAGCCTAAAGCTCTT,,
65 5328,AA425700,,20,127,AGCCTAAAGCTCTTTATTTG,,
5329,AA425700,,20,121,AAAGCTCTTTATTTGATCAAT,,
5330,AA425700,,20,115,TTTATTTGATCAATTTTCCA,,
5331,AA425700,,20,109,TGATCAATTTTCCACAAATG,,
5332,AA425700,,20,103,ATTTTCCACAAATGTATCAT,,
70 5333,AA425700,,20,97,CACAAATGTATCATTTCCTT,,
5334,AA425700,,20,91,TGTATCATTTCTTTAAAAAG,,
5335,AA425700,,20,85,ATTTCTTTAAAAAGTAAATA,,
5336,AA425700,,20,79,TTAAAAAGTAAATAAGCTCT,,
5337,AA425700,,20,73,AGTAAATAAGCTCTTGATCC,,
75 5338,AA425700,,20,67,TAAGCTCTTGATCCCAACTG,,

5339,AA425700,,20,61,CTTGATCCCAACTGTTCTTT,,
5340,AA425700,,20,55,CCCAACTGTTCTTTGGGTCT,,
5341,AA425700,,20,49,TGTTCTTTGGGTCTCTATTCT,,
5342,AA425700,,20,43,TTGGGTCTCTATTCTCCATA,,
5 5343,AA425700,,20,37,CTCTATTCTCCATATGAGGG,,
5344,AA425700,,20,31,TCTCCATATGAGGGTTCCT,,
5345,AA425700,,20,25,TATGAGGGTTCCTTGATTCT,,
5346,AA425700,,20,19,GGTTCCTTGATTCAAATAA,,
5347,AA425700,,20,13,CTTGATTCAAATAAAAGATT,,
10 5348,AA425700,,20,7,TCAAATAAAAGATTAAATAA,,
5349,AA425700,,20,1,AAAAGATTAAATAAAATGTG,,
(GENBANK ACCESSION NO. AA459692)
GCCTGTTAATACAGTAGTTGTAATAATGTACGTGTATTAGCAAGGAAACATAAACTGCCTGGAATAAACTGTAAACCATGGAATAT
CAGACACCTGCCTGATATTCTCACTACAAACATTTCTGGTCAAAATTTGCTCTCTGACGATGATGGTCATTTGGAGAACAACAAACAG
15 CAAAGCAAGAGGAGAGAACAAGAGTATCCTGAGGCGGTCTCCTGCAGTGCTCATAGCTGTTCTCCTTAGCCTCCACCTGGTGCC
CTGGACTAGACCTCCAGAGAATTCC
(SEQ ID NO: 5350)
5351,AA459692,,20,267,GGAATTCTCTGGAGGTCTAG,,
20 5352,AA459692,,20,261,CTCTGGAGGTCTAGTCCAGG,,
5353,AA459692,,20,255,AGGTCTAGTCCAGGGCCACC,,
5354,AA459692,,20,249,AGTCCAGGGCCACCAGGTGG,,
5355,AA459692,,20,243,GGGCCACCAGGTGGAAGGCT,,
5356,AA459692,,20,237,CCAGGTGGAAGGCTAAGGAG,,
25 5357,AA459692,,20,231,GGAAGGCTAAGGAGGAACAG,,
5358,AA459692,,20,225,CTAAGGAGGAACAGCTATGA,,
5359,AA459692,,20,219,AGGAACAGCTATGAGCACTG,,
5360,AA459692,,20,213,AGCTATGAGCACTGCAGGAG,,
5361,AA459692,,20,207,GAGCACTGCAGGAGACCGCC,,
30 5362,AA459692,,20,201,TGCAGGAGACCGCCTCAGGA,,
5363,AA459692,,20,195,AGACCGCCTCAGGATACTCT,,
5364,AA459692,,20,189,CCTCAGGATACTCTTGTCT,,
5365,AA459692,,20,183,GATACTCTTGTCTCTCCTC,,
5366,AA459692,,20,177,CTTGTCTCTCCTCTTGCTT,,
35 5367,AA459692,,20,171,CTCTCCTCTTGCTTTGCTGT,,
5368,AA459692,,20,165,TCTTGCTTTGCTGTTTTGT,,
5369,AA459692,,20,159,TTTGCTGTTTTGTCTCCA,,
5370,AA459692,,20,153,GTITTTGTCTCCTCAATGAC,,
5371,AA459692,,20,147,GTCTCCTCAATGACCATCAT,,
40 5372,AA459692,,20,141,CAAAATGACCATCATCGTCAG,,
5373,AA459692,,20,135,ACCATCATCGTCAGAAGACA,,
5374,AA459692,,20,129,ATCGTCAGAAGACAATTTG,,
5375,AA459692,,20,123,AGAAGACAATTTTGACCACG,,
5376,AA459692,,20,117,CAATTTTGACCACGAAATGT,,
45 5377,AA459692,,20,111,TGACCAAGAAATGTTTGTAG,,
5378,AA459692,,20,105,CGAAATGTTTGTAGTGAGAA,,
5379,AA459692,,20,99,GTITGTAGTGAGAATATCAG,,
5380,AA459692,,20,93,AGTGAGAATATCAGGCAGGT,,
5381,AA459692,,20,87,AAATATCAGGCAGGTGTCTGA,,
50 5382,AA459692,,20,81,AGGCAGGTGTCTGATATTCC,,
5383,AA459692,,20,75,GTGTCTGATATCCATGGTT,,
5384,AA459692,,20,69,GATATTCCATGGTTTACAGT,,
5385,AA459692,,20,63,CCATGGTTTACAGTTTATTC,,
5386,AA459692,,20,57,TTTACAGTTTATCCAGGCA,,
55 5387,AA459692,,20,51,GTITATCCAGGCAGGTTTA,,
5388,AA459692,,20,45,TCCAGGCAGGTTATGTTTC,,
5389,AA459692,,20,39,CAGGTTTATGTTTCCTTGCT,,
5390,AA459692,,20,33,TATGTTTCCTTGCTAATACA,,
5391,AA459692,,20,27,TCCTTGCTAATACACGTACA,,
60 5392,AA459692,,20,21,CTAATACACGTACAATTTTA,,
5393,AA459692,,20,15,CACGTACAATTTTACAACATA,,
5394,AA459692,,20,9,CAATTTTACAACACTACTGTAT,,
5395,AA459692,,20,3,TACAACACTGTATTAAACAG,,
(GENBANK ACCESSION NO. AA487557)
65 TTTTCAAATTTTAAATTAATAATCTTTATTGAATAAAAAATGTTTCAGACTAGGTAAGACTAAGAAAGCAGAATGTTTACATCTCTAA
AAATATTAAGCTAAATCTCTATAAATGCAGTACAAAGAAAGCCTACAGCTTAAGACACCTCTCCCTCCCATCCATACAATTTGGA
ATATCAACTGTGTACAACAAATGTACTCAAGTTTATAATGTCCCAACCTTAAGACTAGAAAAATCATCCCAAGAAAAAGGCCTAT
AGTTGGTTTAATTTACCTGAGAATACTGTGATAAAAAATCAATATATTTTCAGAGCTAGTAAGTATTAAAAATAGTGTCTCAAAA
AGGGGACATC
70 (SEQ ID NO: 5396)
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75 5400,AA487557,,20,320,CACTAATTTTAAATACTTA,,

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5403,AA487557,,20,302,TACTAGCTCTGAAATATATT,,
5404,AA487557,,20,296,CTCTGAAATATATTGATTTT,,
5 5405,AA487557,,20,290,AATATATTGATTTTATCAC,,
5406,AA487557,,20,284,TTGATTTTATCACAGTATT,,
5407,AA487557,,20,278,TTATCACAGTATTCTCAGG,,
5408,AA487557,,20,272,ACAGTATTCTCAGGGTAAAA,,
5409,AA487557,,20,266,TTCTCAGGGTAAAAATTAAC,,
10 5410,AA487557,,20,260,GGGTGAAATTAACCAACTA,,
5411,AA487557,,20,254,AATTAACCAACTATAGGCC,,
5412,AA487557,,20,248,ACCAACTATAGGCCTTTTTC,,
5413,AA487557,,20,242,TATAGGCCTTTTCTTGGA,,
5414,AA487557,,20,236,CCTTTTCTTGGAATGATT,,
15 5415,AA487557,,20,230,TCTTGGAATGATTTCTAGT,,
5416,AA487557,,20,224,GATGATTTTCTAGTCTTAAG,,
5417,AA487557,,20,218,TTTCTAGTCTTAAGGTTGG,,
5418,AA487557,,20,212,GTCTTAAGGTTTGGGGACAT,,
5419,AA487557,,20,206,AGGTTTGGGGACATTATAAA,,
20 5420,AA487557,,20,200,GGGGACATTATAAACTTGAG,,
5421,AA487557,,20,194,ATTATAAACTTGAGTACATT,,
5422,AA487557,,20,188,AACTTGAGTACATTGTGT,,
5423,AA487557,,20,182,AGTACATTGTGTACACAG,,
5424,AA487557,,20,176,TTGTGTACACAGTTGATA,,
25 5425,AA487557,,20,170,GTACACAGTTGATATCCAA,,
5426,AA487557,,20,164,AGTTGATATCCAAATGTGA,,
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30 5430,AA487557,,20,140,TGGGAGGGAGAGGTGTCTTA,,
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5432,AA487557,,20,128,GTGTCTTAAGCTGTAGGCTT,,
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5434,AA487557,,20,116,GTAGGCTTTTCTTTGTACTG,,
35 5435,AA487557,,20,110,TTTTCTTTGTACTGCATTTA,,
5436,AA487557,,20,104,TTGTACTGCATTATAGAGA,,
5437,AA487557,,20,98,TGCATTATAGAGATTTAGC,,
5438,AA487557,,20,92,TATAGAGATTTAGCTTTAAT,,
5439,AA487557,,20,86,GATTTAGCTTTAATATTTT,,
40 5440,AA487557,,20,80,GCTTTAATATTTTATAGAGA,,
5441,AA487557,,20,74,ATATTTTATAGAGATGTAAA,,
5442,AA487557,,20,68,TTTAGAGATGTAAACATTC,,
5443,AA487557,,20,62,GATGTAAACATTTCTGCTT,,
5444,AA487557,,20,56,AAACATTTCTGCTTTCTTAGT,,
45 5445,AA487557,,20,50,TCTGCTTTCTTAGCTTACC,,
5446,AA487557,,20,44,TTCTTAGCTTTACCTAGTCT,,
5447,AA487557,,20,38,GTCTTACCTAGTCTGAAACA,,
5448,AA487557,,20,32,CCTAGTCTGAAACATTTTTA,,
5449,AA487557,,20,26,CTGAAACATTTTATTCAAT,,
50 5450,AA487557,,20,20,CATTTTATTCAATAAAGAT,,
5451,AA487557,,20,14,TATTCAATAAAGATTTAAT,,
5452,AA487557,,20,8,ATAAAGATTTAATTAAAT,,
5453,AA487557,,20,2,ATTTAATTAAATTTGAAA,,
(GENBANK ACCESSION NO. T69168)
55 CAATAANGTGCNTTCAACTCAGCAATATACATATCANTGCNTTTCCTCATTANTTAATTGATCCATCAATAAATATACAAAAACCA
GAGGAAGGGTGTGCTCTGAAAAGTCAAAGTAACAATAACAAGTGGTCATTGTACAGCACAAGANTGAACAATGGGCTATTCTTTGAA
AACTCAAAACAAATGATTTACAAAGACATATCTATAACATAAAGGTGAATGGACCATGTATTCTTATTCTTANGTACATTTTGC
TTTTCCAGNTAAGTCAAAATGTTTCTCTCTCTTACTCCTCTGATATTNCAGTNTTGAATGAATGTTGGCTACANAATCTNTTCT
(SEQ ID NO: 5454)
60 5455,T69168,,20,326,AGAANAGATTNTGTAGCCAA,,
5456,T69168,,20,320,GATTNTGTAGCCAAACATTCA,,
5457,T69168,,20,314,GTAGCCAAACATTCAATCAAN,,
5458,T69168,,20,308,AACATTCATTCAANACTGNA,,
65 5459,T69168,,20,302,CATTCAANACTGNAATATCA,,
5460,T69168,,20,296,ANACTGNAATATCAGAGGAG,,
5461,T69168,,20,290,NAATATCAGAGGAGTAAGGA,,
5462,T69168,,20,284,CAGAGGAGTAAGGAGAGAGG,,
5463,T69168,,20,278,AGTAAGGAGAGAGGAAACAT,,
70 5464,T69168,,20,272,GAGAGAGGAAACATTTGACT,,
5465,T69168,,20,266,GGAAACATTTGACTTANCTG,,
5466,T69168,,20,260,ATTTGACTTANCTGGAAAAAG,,
5467,T69168,,20,254,CTTANCTGGAAAAAGCAAAAT,,
5468,T69168,,20,248,TGAAAAAGCAAAATGTACNT,,
75 5469,T69168,,20,242,AGCAAAATGTACNTAAGAAT,,

5470,T69168,,20,236,ATGTACNTAAGAATAAGAAT,,
5471,T69168,,20,230,NTAAGAATAAGAATAACATG,,
5472,T69168,,20,224,ATAAGAATAACATGGTCCAT,,
5 5473,T69168,,20,218,ATAACATGGTCCATTACCT,,
5474,T69168,,20,212,TGGTCCATTACCTTTATGT,,
5475,T69168,,20,206,ATTACCTTTATGTTATAGA,,
5476,T69168,,20,200,CTTTATGTTATAGATATGTC,,
5477,T69168,,20,194,GTATAGATATGTCCTTGTG,,
5478,T69168,,20,188,GATATGTCCTTGTGTAAATC,,
10 5479,T69168,,20,182,TCCTTGTGTAAATCATTTGT,,
5480,T69168,,20,176,TGTAAATCATTTGTTTGTAG,,
5481,T69168,,20,170,TCATTTGTTTGTAGTTTCA,,
5482,T69168,,20,164,GTITGTAGTTTCAAAGAAT,,
5483,T69168,,20,158,AGTTTCAAAGAATAGCCCA,,
15 5484,T69168,,20,152,CAAAGAATAGCCCATTTGTC,,
5485,T69168,,20,146,ATAGCCCATTTGTCANTCTT,,
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5488,T69168,,20,128,TTGTGCTGTACAATGACCAC,,
20 5489,T69168,,20,122,TGTACAATGACCACTGTTAT,,
5490,T69168,,20,116,ATGACCACTGTTATTTGTAC,,
5491,T69168,,20,110,ACTGTTATTGTTACTTTGAC,,
5492,T69168,,20,104,ATTGTTACTTTGACTTTTCA,,
5493,T69168,,20,98,ACTTTGACTTTTCAGAGCAC,,
25 5494,T69168,,20,92,ACTTTTCAGAGCACACCCTT,,
5495,T69168,,20,86,CAGAGCACACCCTTCTCTG,,
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5497,T69168,,20,74,TTCTCTGGTTTGTATAT,,
5498,T69168,,20,68,TGGTTTTGTATATTATTG,,
30 5499,T69168,,20,62,TTGTATATTTATTGATGGAT,,
5500,T69168,,20,56,ATTTATTGATGGATCAATTA,,
5501,T69168,,20,50,TGATGGATCAATTAANTAAT,,
5502,T69168,,20,44,ATCAATTAANTAATGAGGAA,,
5503,T69168,,20,38,TAANTAATGAGGAAANGCAN,,
35 5504,T69168,,20,32,ATGAGGAAANGCANTGATAT,,
5505,T69168,,20,26,AAANGCANTGATATGTATAT,,
5506,T69168,,20,20,ANTGATATGTATATTGCTGA,,
5507,T69168,,20,14,ATGTATATTGCTGAGTTGAA,,
5508,T69168,,20,8,ATTGCTGAGTTGAAANGCAC,,
40 5509,T69168,,20,2,GAGTTGAAANGCACNTTATT,,
(GENBANK ACCESSION NO. AI313387)
CAATTTCCAGTACCTTTATTTAAAGTATATTAAATAAATTATCTCAATATATACAAATAGAACAAATTACCTACATAAAATAGAAA
ATCCCATATAGAAAACCTTTTAAAAAATTATATATACAATGTCAACCATAGAAAGCTTTAAAGTACCTTAAATCATAAACTCTGTAG
TTTGTATAGTAGTCTTATAAAAAATATAGTTAGCTCTCAAAATGTTTAAATGCCACTTAAAGTCAGTTAAAGTGCAGATTGTAAGCATATT
45 AGGAAGGTGCCCAAGAATACCAATGTCTCCTGCACCTTAACACATTAAATACAAAGTTGCCAATTGTTTTGAATTTCCAAATGTATTCC
TGAAAAAAGAACCTAAACACTATATTATAGACATATGTTAGAAAAAGTCTAGAAATGCACCCAATTTCCTTCCATTCTACTTT
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(SEQ ID NO: 5510)
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5512,AI313387,,20,458,GCCCGAAAAGCTTTTGAGGG,,
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5514,AI313387,,20,446,TTTGAGGNGCTGACTTCAAT,,
5515,AI313387,,20,440,GGNCTGACTTCAATCCATGT,,
55 5516,AI313387,,20,434,ACTTCAATCCATGTAGGAAA,,
5517,AI313387,,20,428,ATCCATGTAGGAAAGTAGAA,,
5518,AI313387,,20,422,GTAGGAAAGTAGAATGGAAG,,
5519,AI313387,,20,416,AAGTAGAATGGAAGGAAATT,,
5520,AI313387,,20,410,AATGGAAGGAAATTGGGTGC,,
60 5521,AI313387,,20,404,AGGAAATTGGGTGCATTCT,,
5522,AI313387,,20,398,TTGGGTGCATTCTAGGACT,,
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65 5526,AI313387,,20,374,TAACATATGTCTATAATATA,,
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70 5531,AI313387,,20,344,TCTTTTTTTTTTCAGGAATA,,
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5533,AI313387,,20,332,CAGGAATACATTTGGAAATT,,
5534,AI313387,,20,326,TACATTTGGAAATTCAAAAC,,
5535,AI313387,,20,320,TGGAAATTCAAAACAATTGG,,
75 5536,AI313387,,20,314,TTCAAAACAATTGGCAAAT,,

5537, AI313387,,20,308,ACAATTGGCAAACCTTTGTAT,,
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5540, AI313387,,20,290,ATTAATGTGTTAAGTGCAGG,,
5 5541, AI313387,,20,284,GTGTTAAGTGCAGGAGACAT,,
5542, AI313387,,20,278,AGTGCAGGAGACATTGGTAT,,
5543, AI313387,,20,272,GGAGACATTGGTATTCTGGG,,
5544, AI313387,,20,266,ATTGGTATTCTGGGCACCTT,,
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10 5546, AI313387,,20,254,GGCACCTTCCTAATATGCTT,,
5547, AI313387,,20,248,TTCTAATATGCTTTACAAT,,
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5550, AI313387,,20,230,ATCTGCACITTAACGTACTT,,
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5559, AI313387,,20,176,TTTATAAGACTACTATACAA,,
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25 5561, AI313387,,20,164,CTATACAACTACAGAGTTT,,
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5563, AI313387,,20,152,CAGAGTTTATGATTTAAGGT,,
5564, AI313387,,20,146,TTATGATTTAAGGTACTTAA,,
5565, AI313387,,20,140,TTTAAGGTACTTAAAGCTTC,,
30 5566, AI313387,,20,134,GTACTTAAAGCTTCTATGGT,,
5567, AI313387,,20,128,AAAGCTTCTATGGTTGACAT,,
5568, AI313387,,20,122,TCTATGGTTGACATTGTATA,,
5569, AI313387,,20,116,GTGACATTGTATATATAAT,,
5570, AI313387,,20,110,ATTGTATATATAATTTTTTA,,
35 5571, AI313387,,20,104,TATATAATTTTTTAAAAAGG,,
5572, AI313387,,20,98,ATTTTTTAAAAAGGTTTTCT,,
5573, AI313387,,20,92,TAAAAAGGTTTTCTATATGG,,
5574, AI313387,,20,86,GGTTTTCTATATGGGGATTT,,
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40 5576, AI313387,,20,74,GGGGATTTTCTATTTATGTA,,
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5580, AI313387,,20,50,ATATTGTTCTATTTGTATAT,,
45 5581, AI313387,,20,44,TTCTATTTGTATATATTGAG,,
5582, AI313387,,20,38,TTGTATATATTGAGATAATT,,
5583, AI313387,,20,32,ATATTGAGATAATTTATTTA,,
5584, AI313387,,20,26,AGATAATTTATTAAATATAC,,
5585, AI313387,,20,20,TTTATTTAAATATACTTTAAA,,
50 5586, AI313387,,20,14,TAATATACTTTAAATAAAGG,,
5587, AI313387,,20,8,ACTTTAAATAAAGGTGACTG,,
5588, AI313387,,20,2,ATAAAGGTGACTGGGAATT,,
(GENBANK ACCESSION NO. AA909635)
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55 AAAATGCAATCAAACCTACATATCTTTTAAATATTCGAAAGTCAGATTTTGTCTGATTGCCCTATCCAATTAGGGCAAATTAGTGA
GGGTTTTTTTGTGTTTTTGTGTTTTTCTAACAATAGTCTGAAACATAAAATTAAGTTTGTGTTAAAAACAATTCTTGAAACTGTCA
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(SEQ ID NO: 5589)
60 5590, AA909635,,20,339,ATATGAAGTTAGTATACAGC,,
5591, AA909635,,20,333,AGTTAGTATACAGCCAGAAC,,
5592, AA909635,,20,327,TATACAGCCAGAACGCCAA,,
5593, AA909635,,20,321,GCCAGAACGCCAAGCCTCA,,
65 5594, AA909635,,20,315,ACAGCCAAAGCCTCAATCTT,,
5595, AA909635,,20,309,AAGCCTCAATTCTTGACCT,,
5596, AA909635,,20,303,CAATCTTGTAACCTTGTC,,
5597, AA909635,,20,297,TGTACCTTGTCCTTTTA,,
5598, AA909635,,20,291,CTTGTCCTTTTATTACTG,,
70 5599, AA909635,,20,285,TCTTTTATTACTGTTTAAAT,,
5600, AA909635,,20,279,TATTACTGTTTAAATCAATAG,,
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5602, AA909635,,20,267,ATCAATAGATATCATATGTT,,
5603, AA909635,,20,261,AGATATCATATGTTTATGAC,,
75 5604, AA909635,,20,255,CATATGTTTATGACAGTTTC,,

5605,AA909635,,20,249,TTTATGACAGTTTCAAGAAT,,
5606,AA909635,,20,243,ACAGTTTCAAGAATTGTTTT,,
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5611,AA909635,,20,213,CTTAATTTATGTTTCAGAC,,
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5613,AA909635,,20,201,TTTCAGACTATTGTTAGAAA,,
10 5614,AA909635,,20,195,ACTATTGTTAGAAAAACAAA,,
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5618,AA909635,,20,171,AAAAACAAAAACCCCTCACT,,
15 5619,AA909635,,20,165,AAAAACCCCTCACTAATTTG,,
5620,AA909635,,20,159,CCCTCACTAATTTGCCCTAA,,
5621,AA909635,,20,153,CTAATTTGCCCTAATTGGAT,,
5622,AA909635,,20,147,TGCCCTAATTGGATAGGGCA,,
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20 5624,AA909635,,20,135,ATAGGGCAATCAGAACAAAA,,
5625,AA909635,,20,129,CAATCAGAACAAAAATCTGAC,,
5626,AA909635,,20,123,GAACAAAAATCTGACTTTCGA,,
5627,AA909635,,20,117,AATCTGACTTTCGAATATTT,,
5628,AA909635,,20,111,ACTTTCGAATATTTAAAGA,,
25 5629,AA909635,,20,105,GAATATTTAAAGATATGTA,,
5630,AA909635,,20,99,TTAAAGATATGTAAGTTTG,,
5631,AA909635,,20,93,GATATGTAAGTTTGATTGCA,,
5632,AA909635,,20,87,TAAGTTTGATTGCAATTTTCG,,
5633,AA909635,,20,81,TGATTGCAATTTCTGACATT,,
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5635,AA909635,,20,69,CGTACATTTTAAGCAAACTA,,
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5637,AA909635,,20,57,GCAAACTAGGTTAACAACAA,,
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5640,AA909635,,20,39,AACATAGCCTAGTCAAACTT,,
5641,AA909635,,20,33,GCCTAGTCAAACTTCTCAGG,,
5642,AA909635,,20,27,TCAAACTTCTCAGGAAACTT,,
5643,AA909635,,20,21,TTCTCAGGAAACTTGTTTTA,,
40 5644,AA909635,,20,15,GGAAACTTGTTTTAATAAAT,,
5645,AA909635,,20,9,TTGTTTAAATAATATGTAA,,
5646,AA909635,,20,3,TAATAAATATGTAAAAATAC,,
(GENBANK ACCESSION NO. R00103)
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45 GGGGCTGGCCTCAGTAGGGGCCTCAGTGGGGCTTGGGGTCTATGGGCTTCTCCTCCTCTCTAAACATTGGGAAGCCOAGTGCTTC
TGAAGGTTTCATCAGGGGACAGATCGGGGAGAGTTGGCTTAAAGGTGGCAGCATCACTGTCATCTCCAGTAGTGGCTCCGGCACAA
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(SEQ ID NO: 5647)
50 5648,R00103,,20,346,ATAAAATAAAATGGAAGTTT,,
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55 5652,R00103,,20,322,TGTGGGGCTCCCNATCTNA,,
5653,R00103,,20,316,GCTCCCNATCTNAAGCTGC,,
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60 5657,R00103,,20,292,TGAGATCTGGGNAGGAACCC,,
5658,R00103,,20,286,CTGGGNAGGAACCCCTTAATC,,
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65 5662,R00103,,20,262,CTCTNACCTNACCTNACTAGA,,
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5664,R00103,,20,250,CNACTAGACCTTGTGCCGGA,,
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5666,R00103,,20,238,GTGCCGAGCCGACTACTGG,,
70 5667,R00103,,20,232,GAGCCGACTACTGGAGATGA,,
5668,R00103,,20,226,ACTACTGGAGATGACAGTGA,,
5669,R00103,,20,220,GGAGATGACAGTGATGCTGC,,
5670,R00103,,20,214,GACAGTGATGCTGCCACCTT,,
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75 5672,R00103,,20,202,GCCACCTTTAAGCCAACCTCT,,

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5676,R00103,,20,178,GATCTGTCCCCTGATGAACC,,
5 5677,R00103,,20,172,TCCCCTGATGAACCTTCAGA,,
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5680,R00103,,20,154,GAAGCACTCGGCTTCCCAAT,,
5681,R00103,,20,148,CTCGGCTTCCCAATGTTAGA,,
10 5682,R00103,,20,142,TTCCCAATGTTAGAGAAGGA,,
5683,R00103,,20,136,ATGTTAGAGAAGGAGGAGGA,,
5684,R00103,,20,130,GAGAAGGAGGAGGAAGCCCA,,
5685,R00103,,20,124,GAGGAGGAAGCCCATAGACC,,
5686,R00103,,20,118,GAAGCCCATAGACCCCAAG,,
15 5687,R00103,,20,112,CATAGACCCCAAGCCCCAC,,
5688,R00103,,20,106,CCCCCAAGCCCACTGAGGC,,
5689,R00103,,20,100,AGCCCACTGAGGCCCTAC,,
5690,R00103,,20,94,ACTGAGGCCCTACTGAGGC,,
5691,R00103,,20,88,GCCCTACTGAGGCCAGCCC,,
20 5692,R00103,,20,82,ACTGAGGCCAGCCCGAGCC,,
5693,R00103,,20,76,GCCAGCCCGAGCCANCCCC,,
5694,R00103,,20,70,CCCGAGCCANCCCCAGACCC,,
5695,R00103,,20,64,CCANCCCCAGACCCAGCCC,,
5696,R00103,,20,58,CCAGACCCAGCCCGGTGG,,
25 5697,R00103,,20,52,CCCAGCCCGGTGGCTGAA,,
5698,R00103,,20,46,CCCGGTGGCTGAAGAGGCTG,,
5699,R00103,,20,40,GGCTGAAGAGGCTGCCCT,,
5700,R00103,,20,34,AGAGGCTGCCCTCAGCTG,,
30 5701,R00103,,20,28,TGCCCCCTCAGCTGTCGAGG,,
5702,R00103,,20,22,CTCAGCTGTCGAGAGGGGG,,
5703,R00103,,20,16,TGTCGAGGAGGGGGCCGCG,,
5704,R00103,,20,10,GGAGGGGGCCGCGCGGACC,,
5705,R00103,,20,4,GGCCGCGCGGACCCCTGGCA,,
(GENBANK ACCESSION NO. N35316)
35 NGAGCTTATCTTCAATTTTATGTTGGAATCTACAATTGCAAAGTGGTTCAAAGTCATTTCTTATACCACTTCACAATACACACACA
GATTTAGGAAACTTAAAAAAGTTCTTTAAAAAATCTAATAGGATTTACCTATTTTACTGGCCAAAGTGTAATAAACCCTAA
ATGTGCTTTCTCTAATTTTCTTGTACAATCTTATTGACATTTTATAGCTAATCCATATATGCATAGAACCGAGGCTATTATTTG
CTGCAACAACCTTTTATAAAAAGTTATGAAGTTTAAAGTATATTTTCGTATCAAGAGTACTTAATATTTGTAAACACTAAGAAACA
AACATACTTCTATCAAAACCTCTAGCTG
40 (SEQ ID NO: 5706)

5707,N35316,,20,361,CAGCTAGAGGTTTGTATAGG,,
5708,N35316,,20,355,GAGGTTTGTATAGGAAGTAT,,
5709,N35316,,20,349,TGTATAGGAAGTATGTTGT,,
45 5710,N35316,,20,343,GGAAAGTATGTTGTTCTTA,,
5711,N35316,,20,337,ATGTTTGTCTTAGTGTTT,,
5712,N35316,,20,331,GTTCCTTAGTGTTACAAAT,,
5713,N35316,,20,325,TAGTGTTACAAATATTAAG,,
5714,N35316,,20,319,TTACAAATATTAAGTACTCT,,
50 5715,N35316,,20,313,ATATTAAGTACTCTTGATAC,,
5716,N35316,,20,307,AGTACTCTTGATACGAAAAT,,
5717,N35316,,20,301,CTTGATACGAAAATATACTT,,
5718,N35316,,20,295,ACGAAAATATACTTTTAAAC,,
5719,N35316,,20,289,ATATACTTTTAAACTTCATA,,
55 5720,N35316,,20,283,TTTTAACTTCATAACCTTT,,
5721,N35316,,20,277,ACTTCATAACCTTTTATAA,,
5722,N35316,,20,271,TAACCTTTTATAAAAGTTG,,
5723,N35316,,20,265,TTTTATAAAAGTTGTTGCAG,,
5724,N35316,,20,259,AAAAGTTGTTGCAGCAAAAT,,
60 5725,N35316,,20,253,TGTTGCAGCAAAATAATAGC,,
5726,N35316,,20,247,AGCAAAATAATAGCCTCGGT,,
5727,N35316,,20,241,ATAATAGCCTCGGTTCTATG,,
5728,N35316,,20,235,GCCTCGGTTCTATGCATATA,,
5729,N35316,,20,229,GTTCATGCATATATGGATT,,
65 5730,N35316,,20,223,TGCATATATGGATTAGCTAT,,
5731,N35316,,20,217,TATGGATTAGCTATAAAAAA,,
5732,N35316,,20,211,TTAGCTATAAAAAATGTCAA,,
5733,N35316,,20,205,ATAAAAAATGTCAATAAGAT,,
5734,N35316,,20,199,AATGTCAATAAGATTGTACA,,
70 5735,N35316,,20,193,AATAAGATTGTACAAGGAAA,,
5736,N35316,,20,187,ATTGTACAAGGAAAAATTAGA,,
5737,N35316,,20,181,CAAGGAAAAATTAGAGAAAGG,,
5738,N35316,,20,175,AAATTAGAGAAAGGCACATT,,
5739,N35316,,20,169,GAGAAAGGCACATTTAGGOT,,
75 5740,N35316,,20,163,GGCACATTTAGGGTTATTT,,

5741,N35316,,20,157,TTTAGGGTTTATTTTACAA,,
5742,N35316,,20,151,GTATTTTTTACACTGGC,,
5743,N35316,,20,145,TTTTTACACTGGCCAGTAA,,
5744,N35316,,20,139,CACTTGGCCAGTAAAATAGG,,
5 5745,N35316,,20,133,GCCAGTAAAATAGGGTAAAT,,
5746,N35316,,20,127,AAAATAGGGTAAATCCTATT,,
5747,N35316,,20,121,GGGTAAATCCTATTAGAATT,,
5748,N35316,,20,115,ATCCTATTAGAATTTTTTAA,,
5749,N35316,,20,109,TTAGAATTTTTTAAAGAACT,,
10 5750,N35316,,20,103,TTTTTTAAAGAACTTTTTTT,,
5751,N35316,,20,97,AAAGAACTTTTTTTAAGTTT,,
5752,N35316,,20,91,CTTTTTTAAAGTTTCTTAA,,
5753,N35316,,20,85,TTAAGTTTCTTAAATCTGTG,,
5754,N35316,,20,79,TTCTTAAATCTGTGTGTGTA,,
15 5755,N35316,,20,73,AACTCTGTGTGTGTATTGTGA,,
5756,N35316,,20,67,TGTGTGTATTGTGAAGTGGT,,
5757,N35316,,20,61,TATGTGAAGTGGTATAAGA,,
5758,N35316,,20,55,GAAGTGGTATAAGAAATGAC,,
5759,N35316,,20,49,GTATAAGAAATGACTTTGAA,,
20 5760,N35316,,20,43,GAAATGACTTTGAACCACTT,,
5761,N35316,,20,37,ACTTTGAACCACTTTGCAAT,,
5762,N35316,,20,31,AACCACTTTGCAATTTGTAGA,,
5763,N35316,,20,25,TTTGCAATTGTAGATTCCCA,,
5764,N35316,,20,19,ATTGTAGATTCCCAACAATA,,
25 5765,N35316,,20,13,GATTCCCAACAATAAAATTG,,
5766,N35316,,20,7,CAACAATAAAATTGAAGATA,,
5767,N35316,,20,1,TAAATTTGAAGATAAGCTCN,,
(GENBANK ACCESSION NO. AA293300)
AACAGTAATCTTCAGACTTTATTAATAAAATGACATAAAGTGCATCTTATTAATAAAATGTATAAAACCACATAAAATTCAGGGCCCC
30 TGTGCTGGGCAGTGTGATATCCCTTAGAGTGGAGGAAGGTGAGGGATGGAGGGTGAAGTGGGGACTGGGGAGAGGACCAGGGTG
CAGTTAGTTCTCTCGTGTTTGAGTTCAAAGATGGAGCGAGGGTGGATATGTTGGGAAGGGGCACACGGGTCTCACGCAACAACGGA
GGAAGGCAGGCGACAGTCTCTCCCTGAATTTCTGAGGGAAGGCGTACATTGTCACGAAATCTCTCCTGAGCTCGCGCTGTCTCTC
(SEQ ID NO: 5768)
35 5769,AA293300,,20,326,GAGAGGACAGCGGAGCTCA,,
5770,AA293300,,20,320,ACAGCGCGAGCTCAGGAGAG,,
5771,AA293300,,20,314,CGAGCTCAGGAGAGATTTCG,,
5772,AA293300,,20,308,CAGGAGAGATTTCGTGACAA,,
5773,AA293300,,20,302,AGATTTCGTGACAATGTACG,,
40 5774,AA293300,,20,296,CGTGACAATGTACGCCCTTC,,
5775,AA293300,,20,290,AAATGTACGCCCTTCCCTCAG,,
5776,AA293300,,20,284,CGCCTTCCCTCAGAATTCA,,
5777,AA293300,,20,278,TCCCTCAGAATTCAAGGGAAG,,
5778,AA293300,,20,272,AGAATTCAGGGAAGAGACTG,,
45 5779,AA293300,,20,266,CAGGGAAGAGACTGTGCGCT,,
5780,AA293300,,20,260,AGAGACTGTGCGCTGCCTTC,,
5781,AA293300,,20,254,TGTGCGCTGCCTTCCTCCGT,,
5782,AA293300,,20,248,CTGCTTCCCTCCGTGTTGC,,
5783,AA293300,,20,242,TCCTCCGTGTTGCGTGAGA,,
50 5784,AA293300,,20,236,GTGTTGCGTGAGAACCCGT,,
5785,AA293300,,20,230,GCGTGAGAACCCGTGTGCC,,
5786,AA293300,,20,224,GAACCCGTGTGCCCTTCCC,,
5787,AA293300,,20,218,GTGTGCCCTTCCCACCATA,,
5788,AA293300,,20,212,CCCTTCCCACCATATCCACC,,
55 5789,AA293300,,20,206,CCACCATATCCACCCTCGCT,,
5790,AA293300,,20,200,TATCCACCCTCGCTCCATCT,,
5791,AA293300,,20,194,CCCTCGCTCCATCTTTGAAC,,
5792,AA293300,,20,188,CTCCATCTTTGAACCAAC,,
5793,AA293300,,20,182,CTTTGAACCAACACGAGG,,
60 5794,AA293300,,20,176,ACTCAAACACGAGGAACATA,,
5795,AA293300,,20,170,ACACGAGGAACATACTGCAC,,
5796,AA293300,,20,164,GGAACATACTGCACCCTGGT,,
5797,AA293300,,20,158,AACTGCACCCTGGTCTCTC,,
5798,AA293300,,20,152,ACCTGGTCTCTCCCCAGT,,
65 5799,AA293300,,20,146,GTCTCTCCCCAGTCCCCAG,,
5800,AA293300,,20,140,TCCCCAGTCCCCAGTTCAAC,,
5801,AA293300,,20,134,GTCCCCAGTTCAACCTCCAT,,
5802,AA293300,,20,128,AGTTCAACCTCCATCCCTCA,,
5803,AA293300,,20,122,CCCTCCATCCCTCACCTTCC,,
70 5804,AA293300,,20,116,ATCCCTCACCTTCTCTCACT,,
5805,AA293300,,20,110,CACCTTCTCTCACTCTAAGG,,
5806,AA293300,,20,104,CCTCACTCTAAGGGATATC,,
5807,AA293300,,20,98,CTCTAAGGGATATCAACACT,,
5808,AA293300,,20,92,GGGATATCAACACTGCCCCAG,,
75 5809,AA293300,,20,86,TCAACACTGCCAGCACAGG,,

5810,AA293300,,20,80,CTGCCCAGCACAGGGGGCCCT,,
5811,AA293300,,20,74,AGCACAGGGGGCCCTGAATTT,,
5812,AA293300,,20,68,GGGGCCCTGAATTTATGTGG,,
5813,AA293300,,20,62,CTGAATTTATGTGTTTTTA,,
5 5814,AA293300,,20,56,TTATGTGTTTTTATACATT,,
5815,AA293300,,20,50,GGTTTTTATACATTTTTTAA,,
5816,AA293300,,20,44,TATACATTTTTTAATAAGAT,,
5817,AA293300,,20,38,TTTTTTAATAAGATGCACTT,,
5818,AA293300,,20,32,AATAAGATGCACTTTATGTC,,
10 5819,AA293300,,20,26,ATGCACTTTATGTCATTTTT,,
5820,AA293300,,20,20,TTTATGTCATTTTTTAATAA,,
5821,AA293300,,20,14,TCATTTTTTAATAAAGTCTG,,
5822,AA293300,,20,8,TTTAATAAAGTCTGAAGAAT,,
5823,AA293300,,20,2,AAAGTCTGAAGAATTACTGT,,
15 (GENBANK ACCESSION NO. AA278764)
TTTTTTTTTTTTTTTTTTGACAGGAACCTGTTTTTATCCAACCACCTCACCTCCTTAGAATGGGAGGCGAACAGTQAAATAGTGCA
TTTATCTTAAAGTGAATAATCCAGGATGGTAGGGCGAGACCTGTGATGGGTGAATTTACCTCACTTGATACCAAGGGCCCTTA
ATACTCGGGGAAGTGGGACTTTGTGCGACAAAGCCAGGACAATCCCCACCCCCACCCAGCAGTGAATAAAAACCCGTACG
GTCACTTCTATGTGATGGCTGTCTCCCTCTCACCAGACTGCATAGCGGTTCAGATGAACATTGGCACCTAGATGGGGGTCAAGG
20 AGCTGGGGCTGTGATTACAGGGAAGATGCTGAGGGGGACTGGGAGTCTCTGTTTGAATCTTGAAGCAAGGGGTGA
(SEQ ID NO: 5824)

5825,AA278764,,20,404,TCACCCCTTGCTTCAAGATT,,
5826,AA278764,,20,398,CTTGCTTCAAGATTCAAACA,,
25 5827,AA278764,,20,392,TCAAGATTCAAACAGAGACT,,
5828,AA278764,,20,386,TTCAAACAGAGACTCCCAGT,,
5829,AA278764,,20,380,CAGAGACTCCCAGTCCCCCT,,
5830,AA278764,,20,374,CTCCCAGTCCCCCTCAGCAT,,
5831,AA278764,,20,368,GTCCCCCTCAGCATCTTCCC,,
30 5832,AA278764,,20,362,CTCAGCATCTTCCCTGAATC,,
5833,AA278764,,20,356,ATCTTCCCTGAATCACAGCC,,
5834,AA278764,,20,350,CCTGAATCACAGCCCCAGCT,,
5835,AA278764,,20,344,TCACAGCCCCAGCTCCTTGA,,
5836,AA278764,,20,338,CCCCAGCTCCTTGACCCCCA,,
35 5837,AA278764,,20,332,CTCCTTGACCCCATCTAGG,,
5838,AA278764,,20,326,GACCCCATCTAGGTGCCAA,,
5839,AA278764,,20,320,CATCTAGGTGCCAAATGTTT,,
5840,AA278764,,20,314,GGTGCCAAATGTTTCACTGTC,,
5841,AA278764,,20,308,AAATGTTTCACTGCAACCGC,,
40 5842,AA278764,,20,302,TCATCTGCAACCGCTATGCA,,
5843,AA278764,,20,296,GCAACCGCTATGCACTGTGG,,
5844,AA278764,,20,290,GCTATGCACTGTGGTGAGAG,,
5845,AA278764,,20,284,CAGTCTGGTGAGAGGGAGAC,,
5846,AA278764,,20,278,GGTGAGAGGGAGACGCCAT,,
45 5847,AA278764,,20,272,AGGGAGACAGCCATCACATA,,
5848,AA278764,,20,266,ACAGCCATCACATAGAAAGT,,
5849,AA278764,,20,260,ATCACATAGAAAGTGACCGT,,
5850,AA278764,,20,254,TAGAAAGTGACCGTACGGGT,,
5851,AA278764,,20,248,GTGACCGTACGGGTTTTTAA,,
50 5852,AA278764,,20,242,GTACGGGTTTTTAATCACTG,,
5853,AA278764,,20,236,GTTTTTAATCACTGCTGGGT,,
5854,AA278764,,20,230,AATCACTGCTGGGTGGGGTG,,
5855,AA278764,,20,224,TGCTGGGTGGGGTGGGGGTAA,,
5856,AA278764,,20,218,GTGGGGTGGGGGTAGGGGGA,,
55 5857,AA278764,,20,212,TGGGGGTAGGGGGATTGTCC,,
5858,AA278764,,20,206,TAGGGGGATTGTCCTGGCTT,,
5859,AA278764,,20,200,GATTGTCCTGGCTTTGTGCA,,
5860,AA278764,,20,194,CCTGGCTTTGTGACAAAGT,,
5861,AA278764,,20,188,TTTGTGACAAAGTCCCACT,,
60 5862,AA278764,,20,182,GACAAAGTCCCACTTCCCCG,,
5863,AA278764,,20,176,GTCCCACTTCCCCGAGTATT,,
5864,AA278764,,20,170,CTTCCCCGAGTATTAAGGGC,,
5865,AA278764,,20,164,CGAGTATTAAGGGCCCTTGG,,
5866,AA278764,,20,158,TTAAGGGCCCTTGGTATCAA,,
65 5867,AA278764,,20,152,GCCCTTGGTATCAAGTGAGG,,
5868,AA278764,,20,146,GGTATCAAGTGAGGTAAATT,,
5869,AA278764,,20,140,AAGTGAGGTAAATTCACCCA,,
5870,AA278764,,20,134,GGTAAATTCACCCATCACAG,,
5871,AA278764,,20,128,TTACCCATCACAGGGTCTC,,
70 5872,AA278764,,20,122,CATCACAGGGTCTCGCCCTA,,
5873,AA278764,,20,116,AGGGTCTCGCCCTACCATCC,,
5874,AA278764,,20,110,TCGCCCTACCATCCTGGAAT,,
5875,AA278764,,20,104,TACCATCCTGGAATTATTTT,,
5876,AA278764,,20,98,CCTGGAATTATTTCACTTTT,,
75 5877,AA278764,,20,92,ATTATTTCACTTTTAAGATA,,

5878,AA278764,,20,86,TCACCTTTAAGATAAATGCA,,
5879,AA278764,,20,80,TTAAGATAAATGCACTATTT,,
5880,AA278764,,20,74,TAAATGCACTATTTCACTGT,,
5881,AA278764,,20,68,CACTATTTCACTGTTCCGCT,,
5 5882,AA278764,,20,62,TTCACTGTTCCGCTCCCAT,,
5883,AA278764,,20,56,GTTCGCTCCCATTTCTAAGG,,
5884,AA278764,,20,50,CTCCCATTTCTAAGGAGGTGA,,
5885,AA278764,,20,44,TTCTAAGGAGGTGAGGTGGT,,
5886,AA278764,,20,38,GGAGGTGAGGTGGTTGGAAT,,
10 5887,AA278764,,20,32,GAGGTGGTTGGAATAAAAC,,
5888,AA278764,,20,26,GTGGAATAAAACAGTTCC,,
5889,AA278764,,20,20,ATAAAAACAGTTCTGTCAA,,
5890,AA278764,,20,14,ACAGTTCTGTCAAAAAA,,
5891,AA278764,,20,8,CCTGTCAAAAAA,,
15 5892,AA278764,,20,2,AAAAA,,
(GENBANK ACCESSION NO. AA678160)
ACCAATCTTAATTTAGCATTTTAAATGGGGCCACAGTCTTTTTCTCTATTATTGTAATGTTTCTTTTTTAAAGATTGGCCTAGT
ACAATCCCAAGTCCGCTTCCAAATAAAGTAAAGTATTAGTATGAAAAACCTGGCTACAATAAATTAGAGACCATTTAATCCTGC
AATCTTGGTCAAGTTTCATATTTCCACCATAGCACATTAG
20 (SEQ ID NO: 5893)

5894,AA678160,,20,195,CTAATGTGCTATGGTGGAAA,,
5895,AA678160,,20,189,TGCTATGGTGGAAATATGAA,,
5896,AA678160,,20,183,GGTGGAAATATGAACCTTGAC,,
25 5897,AA678160,,20,177,AATATGAACCTTGACCAAGAT,,
5898,AA678160,,20,171,AACTTGACCAAGATTGCAGG,,
5899,AA678160,,20,165,ACCAAGATTGCAGGATTA,,
5900,AA678160,,20,159,ATTGCAGGATTAATGGTCT,,
5901,AA678160,,20,153,GGATTAAATGGTCTCTAATT,,
30 5902,AA678160,,20,147,AATGGTCTCTAATTTATGT,,
5903,AA678160,,20,141,CTCTAATTTATGTAGCCAG,,
5904,AA678160,,20,135,TTTATTGTAGCCAGGTTT,,
5905,AA678160,,20,129,GTAGCCAGGTTTTTCATAC,,
5906,AA678160,,20,123,AGGGTTTTTCATACTAATAC,,
35 5907,AA678160,,20,117,TTTCATACTAATACTTTTA,,
5908,AA678160,,20,111,ACTAATACTTTTACTTTAT,,
5909,AA678160,,20,105,ACTTTTTACTTTATTGGAA,,
5910,AA678160,,20,99,TACTTTATTGGAAGCGGAC,,
5911,AA678160,,20,93,ATTTGGAAGCGGACTTGGAT,,
40 5912,AA678160,,20,87,AAGCGGACTTGGATTGTA,,
5913,AA678160,,20,81,ACTTGGATTGTAAGGGCA,,
5914,AA678160,,20,75,ATTGTAAGGGCAATCTT,,
5915,AA678160,,20,69,CTAGGGCAATCTTTAAAA,,
5916,AA678160,,20,63,CAAACTTTAAAAAAGAAA,,
45 5917,AA678160,,20,57,TTTAAAAAAGAAACATTTA,,
5918,AA678160,,20,51,AAAAGAAACATTACAATA,,
5919,AA678160,,20,45,AACATTACAATAATAGAGA,,
5920,AA678160,,20,39,TACAATAATAGAGAAAAAGA,,
5921,AA678160,,20,33,AATAGAGAAAAAGACTGTGG,,
50 5922,AA678160,,20,27,GAAAAAGACTGTGGCCCCAT,,
5923,AA678160,,20,21,GACTGTGGCCCCATTAAAA,,
5924,AA678160,,20,15,GGCCCCATTAAAAATGCT,,
5925,AA678160,,20,9,ATTAAAAAATGCTAAATTA,,
5926,AA678160,,20,3,AAAATGCTAAATTAAGATTG,,
55 (GENBANK ACCESSION NO. R42770)
TTTTTTTTTTGTAACCTAATCTTTTATTTGTTTCATTAATAAGCAATTTTGATGTGAAGACTAAAAACACACATTTCTGTTTCTTTA
ATACTCAGTGTATACATTTTGCAGATTAAATTTAAATACGTATTTGGACCAGTTATTGATANAATTCCTTCAGACGTTGTTTTC
AACCATCATCTAAATTTAACAATATCTGCATTTTCGGTAAAGTNCCTCAAACCCCTAGTCAAGGGGAAANCTGTAAATCTAATGAATA
AGGANCTTCTCAGGGCAATTAGGACAATATTNCAAAACNNGGCTGCTTGACTCANGGGTGACTTCCTTAAATCCGNGGTTTCTCAGG
60 CCCCNCACCTGTGGGATGTTTTGAGCGGGGTAATNTTTGTTATGGGGGGCTGTCCCTACANCGGGGTTTTAGGGGGG
(SEQ ID NO: 5927)

5928,R42770,,20,411,CCCCCTAAAAACCCGNTGT,,
5929,R42770,,20,405,TAAAACCCGNTGTAGGGAC,,
65 5930,R42770,,20,399,CCCGNTGTAGGGACAGCCCC,,
5931,R42770,,20,393,GTAGGGACAGCCCCCATA,,
5932,R42770,,20,387,ACAGCCCCCATAACAAAN,,
5933,R42770,,20,381,CCCCATAACAAANAATTAC,,
5934,R42770,,20,375,TAACAAANAATTACCCGCT,,
70 5935,R42770,,20,369,ANAATTACCCGCTCAAAAC,,
5936,R42770,,20,363,ACCCGCTCAAAACATCCCA,,
5937,R42770,,20,357,CTCAAAACATCCACAGTGN,,
5938,R42770,,20,351,ACATCCACAGTGNCGGGGC,,
5939,R42770,,20,345,CACAGTGNCGGGGCTGAGA,,
75 5940,R42770,,20,339,GNCGGGGCTGAGAAACNC,,

5941,R42770,,20,333,GCCTGAGAAACCCGCGATT,,
5942,R42770,,20,327,GAACCCGCGATTAAAGGAA,,
5943,R42770,,20,321,NCGGATTAAAGGAAGTCACC,,
5944,R42770,,20,315,TTAAGGAAATCAGCCNTGAG,,
5 5945,R42770,,20,309,AAGTCACCCNTGAGTCAAGC,,
5946,R42770,,20,303,CCCTGAGTCAAGCAGCCCN,,
5947,R42770,,20,297,AGTCAAGCAGCCNGTTTGN,,
5948,R42770,,20,291,GCAGCCNGTTTGNAAATAT,,
5949,R42770,,20,285,CNGTTTGNAAATATTGTCCT,,
10 5950,R42770,,20,279,GNAAATATTGTCCTAATTGC,,
5951,R42770,,20,273,ATTGTCCTAATTGCCCTGAG,,
5952,R42770,,20,267,CTAATTGCCCTGAGAAGNTC,,
5953,R42770,,20,261,CCCCTGAGAAGNTCCTTATT,,
5954,R42770,,20,255,AGAAGNTCCTTATTCTATTAG,,
15 5955,R42770,,20,249,TCCTTATTCTATTAGATTAC,,
5956,R42770,,20,243,TTCTATTAGATTACAGNTTT,,
5957,R42770,,20,237,AGATTTACAGNTTTCCCTT,,
5958,R42770,,20,231,ACAGNTTTCCCTTGACTAG,,
5959,R42770,,20,225,TTCCCTTGACTAGGGGTTT,,
20 5960,R42770,,20,219,TTGACTAGGGGTTTGAAGNA,,
5961,R42770,,20,213,AGGGGTTTGAAGNACTTACC,,
5962,R42770,,20,207,TTGAAGNACTTACCGAAAT,,
5963,R42770,,20,201,NACTTACCGAAATGCAGAT,,
5964,R42770,,20,195,CCGAAATGCAGATATGTTA,,
25 5965,R42770,,20,189,ATGCAGATATGTTAAATTTA,,
5966,R42770,,20,183,ATATGTTAAATTTATGATGA,,
5967,R42770,,20,177,TAAATTTATGATGATGGTTT,,
5968,R42770,,20,171,TATGATGATGGTTTGAAGAA,,
5969,R42770,,20,165,GATGGTTTGAAGAAACACGT,,
30 5970,R42770,,20,159,TTGAAGAAACACGTCTGAAG,,
5971,R42770,,20,153,AACAACGTCTGAAGGAATTN,,
5972,R42770,,20,147,GTCTGAAGGAATTNTATCAA,,
5973,R42770,,20,141,AGGAATTNTATCAAAATAACT,,
5974,R42770,,20,135,TNTATCAAAATAACTGGTCCA,,
35 5975,R42770,,20,129,AAATAACTGGTCCAAATAC,,
5976,R42770,,20,123,CTGGTCCAAATACGTATT,,
5977,R42770,,20,117,CAAAATACGTATTTAAATTT,,
5978,R42770,,20,111,ACGTATTTAAATTTAATCTG,,
5979,R42770,,20,105,TTAAATTTAATCTGCAAAAT,,
40 5980,R42770,,20,99,TTAATCTGCAAAATGTATAC,,
5981,R42770,,20,93,TGCAAAATGTATACACTGAG,,
5982,R42770,,20,87,ATGTATACACTGAGTATTAA,,
5983,R42770,,20,81,ACACTGAGTATTAAAGAAAC,,
5984,R42770,,20,75,AGTATTAAAGAAACAGGAAA,,
45 5985,R42770,,20,69,AAAGAAACAGGAAATGTGTG,,
5986,R42770,,20,63,ACAGGAAATGTGTGTTTTTA,,
5987,R42770,,20,57,AATGTGTGTTTTTAGTCTTC,,
5988,R42770,,20,51,TGTTTTTAGTCTTCACATCA,,
5989,R42770,,20,45,TAGTCTTCACATCAAAATTG,,
50 5990,R42770,,20,39,TCACATCAAAATTGCTCTAT,,
5991,R42770,,20,33,CAAAATTGCTCTATTAATGA,,
5992,R42770,,20,27,TGCTCTATTAATGAACAAAT,,
5993,R42770,,20,21,ATTAATGAACAAATAAAGA,,
5994,R42770,,20,15,GAACAAATAAAGATTAAAGT,,
55 5995,R42770,,20,9,ATAAAGATTAAAGTTACAAA,,
5996,R42770,,20,3,GATTAAAGTTACAAAAAAA,,
(GENBANK ACCESSION NO. H93087)
AAAAAATAATCTGCATTTTTTAAAACTTGATAAAAAATAGTATTTCAAACGTGTACAGTACCAGAAAGTACACAGTTATCAAAAT
GCACACACTTCACTTGGCATCTCCAGCACCTTCAGCTTTCTGTGCCTGGTCTGTTTTGGCATCTCCATTTTCTGCAGGGTTATCCCT
60 CTTGGCAGCATCAGCTTTTCCCTTTTCCCTTTGGGTACCTTCTCTCCCTTCTTGCAGGGGCTTTTGGGCTTGGGCTCTGGCTTT
GGAGGAGCAGGTTCTTTTTTTGGCAGGAAGAGAGGAAAAAGTGAACATCAGTACAATGGACTGAAGAAAAACCCCAACCAA
CCAAAAGTACCAAGGGTAAGAGAAGTTTCTCCTCCTCCTCAAAAGTTTGGTGGTTGGCTTTCTCTAGAATGTTGGATTCCAGAA
GCCACTCAAAATGTCCCACTTTGGCTACAGGCATCAGAAATTTAGAAACCAACCAAAACCCCAAGGGGCAAGAGTCCCAAGTAGAGG
CAATGATTCCAAACAGGCACTAACCATATTCATGGGAAGCCAAGGGAATGGTTTTTGGANGGTTTTAGGTTACAGGCAAG
65 (SEQ ID NO: 5997)
5998,H93087,,20,588,CTTGNCCCTGAACCTAAAAAC,,
5999,H93087,,20,582,CTGAACCTAAAAACCTTCCA,,
6000,H93087,,20,576,CTAAAAACCTTCCAAAAAC,,
70 6001,H93087,,20,570,ACCNTCCAAAAACCATTTCC,,
6002,H93087,,20,564,CAAAAAACCATTTCCCTTGGCT,,
6003,H93087,,20,558,CCATTCCCTTGGCTTCCCAT,,
6004,H93087,,20,552,CCTTGGCTTCCCATGAATTA,,
6005,H93087,,20,546,CTTCCCATGAATTATGGTTA,,
75 6006,H93087,,20,540,ATGAATTATGGTTAGTGCCT,,

6007,H93087,,20,534,TATGGTTAGTGCCTGGTTTG,,
6008,H93087,,20,528,TAATGCCTGGTTTGGAAATCA,,
6009,H93087,,20,522,CTGGTTTGGAAATCATTGCCT,,
5 6010,H93087,,20,516,TGGAATCATTGCCTCTACTT,,
6011,H93087,,20,510,CATTGCCTCTACTTGGGACT,,
6012,H93087,,20,504,CTCTACTTGGGACTCTTGCC,,
6013,H93087,,20,498,TTGGGACTCTTGCCCCCTGG,,
6014,H93087,,20,492,CTCTTGCCCCCTGGGGTTTN,,
6015,H93087,,20,486,CCCCCTGGGGTTTNGCTGGT,,
10 6016,H93087,,20,480,GGGGTTTNGCTGGTTCTGAA,,
6017,H93087,,20,474,TNGCTGGTTCTGAAATTTCT,,
6018,H93087,,20,468,GTCTGAAATTTCTGATGCC,,
6019,H93087,,20,462,AAATTTCTGATGCCTGTAGC,,
6020,H93087,,20,456,CTGATGCCTGTAGCCAAAGT,,
15 6021,H93087,,20,450,CCTGTAGCCAAAGTGGGACA,,
6022,H93087,,20,444,GCCAAAGTGGGACATTTGAG,,
6023,H93087,,20,438,GTGGGACATTTGAGTGGGCT,,
6024,H93087,,20,432,CATTTGAGTGGGCTTCTGGA,,
6025,H93087,,20,426,AGTGGGCTTCTGAAATCCA,,
20 6026,H93087,,20,420,CTTCTGAAATCCAACATT,,
6027,H93087,,20,414,GAAATCCAACATTCTAGAAAG,,
6028,H93087,,20,408,CAACATTCTAGAAAGAAAGCC,,
6029,H93087,,20,402,TCTAGAAAGAAAGCCAACCAC,,
6030,H93087,,20,396,AGAAAGCCAACCACCAAAAA,,
25 6031,H93087,,20,390,CCAACCACCAAAAACTTTTG,,
6032,H93087,,20,384,ACCAAAAACTTTTGAGGAGG,,
6033,H93087,,20,378,AACTTTTGAGGAGGAGGAGA,,
6034,H93087,,20,372,TGAGGAGGAGGAGAACTTC,,
6035,H93087,,20,366,GGAGGAGAACTTCTCTTAC,,
30 6036,H93087,,20,360,GAAACTTCTCTTACCCTTGG,,
6037,H93087,,20,354,TCTCTTACCCTTGGTACTTT,,
6038,H93087,,20,348,ACCCTTGGTACTTTTGGTTG,,
6039,H93087,,20,342,GGTACTTTTGGTTGGTTGTG,,
6040,H93087,,20,336,TTTGGTTGGTTGGTGGTGGT,,
35 6041,H93087,,20,330,TGGTTGTGGTGGTGGTTTCTT,,
6042,H93087,,20,324,TGGGTGGTTTTCTTCAGTCC,,
6043,H93087,,20,318,GTCTTCTTCAGTCCATTGTA,,
6044,H93087,,20,312,TTTCTTCAGTCCATTGACTGATG,,
6045,H93087,,20,306,CCATTGTACTGATGTTCACT,,
40 6046,H93087,,20,300,TACTGATGTTCACTTTTCC,,
6047,H93087,,20,294,TGTTCACTTTTCTCTCTCTT,,
6048,H93087,,20,288,CTTTTCTCTCTTCTCTGCC,,
6049,H93087,,20,282,CCTCTCTTCTCTGCCAAAAA,,
6050,H93087,,20,276,TTCTTGCCAAAAAAGAAAC,,
45 6051,H93087,,20,270,CCAAAAAAGAAACCTGCTC,,
6052,H93087,,20,264,AAAGAAACCTGCTCCTCCAA,,
6053,H93087,,20,258,ACCTGCTCCTCCAAAGCCAG,,
6054,H93087,,20,252,TCCTCCAAAGCCAGAGCCCA,,
6055,H93087,,20,246,AAAGCCAGAGCCCAAGCCTA,,
50 6056,H93087,,20,240,AGAGCCCAAGCCTAAAAAGG,,
6057,H93087,,20,234,CAAGCCTAAAAAGGCCCTG,,
6058,H93087,,20,228,TAAAAAGGCCCTGCAAGA,,
6059,H93087,,20,222,GGCCCCCTGCAAGAAGGGAG,,
6060,H93087,,20,216,TGCAAGAAGGGAGAGAAGG,,
55 6061,H93087,,20,210,GAAGGGAGAGAAGGTACCCA,,
6062,H93087,,20,204,AGAGAAGGTACCCAAAGGGA,,
6063,H93087,,20,198,GGTACCCAAAGGGAAAAAGG,,
6064,H93087,,20,192,CAAAGGGAAAAAGGGAAAAAG,,
6065,H93087,,20,186,GAAAAAGGGAAAAAGCTGATG,,
60 6066,H93087,,20,180,GGGAAAAGCTGATGCTGGCA,,
6067,H93087,,20,174,AGCTGATGCTGGCAAGGAGG,,
6068,H93087,,20,168,TGCTGGCAAGGAGGGGAATA,,
6069,H93087,,20,162,CAAGGAGGGGAATAACCCCTG,,
6070,H93087,,20,156,GGGGAATAACCCCTGCAGAAA,,
65 6071,H93087,,20,150,TAACCCCTGCAGAAAAATGGAG,,
6072,H93087,,20,144,TGCAGAAAAATGGAGATGCCA,,
6073,H93087,,20,138,AAATGGAGATGCCAAAACAG,,
6074,H93087,,20,132,AGATGCCAAAACAGACCAGG,,
6075,H93087,,20,126,CAAAACAGACCAGGCACAGA,,
70 6076,H93087,,20,120,AGACCAGGCACAGAAAGCTG,,
6077,H93087,,20,114,GGCACAGAAAGCTGAAGGTG,,
6078,H93087,,20,108,GAAAGCTGAAGGTGCTGGAG,,
6079,H93087,,20,102,TGAAGGTGCTGGAGATGCCA,,
6080,H93087,,20,96,TGCTGGAGATGCCAAGTGAA,,
75 6081,H93087,,20,90,AGATGCCAAGTGAAGTGTGT,,

6082,H93087,,20,84,CAAGTGAAGTGTGTGCATT,,
6083,H93087,,20,78,AAGTGTGTGCATTTTGTATA,,
6084,H93087,,20,72,GTGCATTTTGTATAACTGTG,,
5 6085,H93087,,20,66,TTTGTATAACTGTGTACTTC,,
6086,H93087,,20,60,TAAGTGTGTACTTCTGGTGA,,
6087,H93087,,20,54,TGTACTTCTGGTACTGTAC,,
6088,H93087,,20,48,TCTGGTGTACTGTACAGTTTG,,
6089,H93087,,20,42,GACTGTACAGTTTGAATAC,,
6090,H93087,,20,36,ACAGTTTGAATACTATTTT,,
10 6091,H93087,,20,30,TGAAATACTATTTTATCA,,
6092,H93087,,20,24,ACTATTTTATCAAGTTT,,
6093,H93087,,20,18,TTTATCAAGTTTATAAAA,,
6094,H93087,,20,12,CAAGTTTATAAAAAATGCAG,,
6095,H93087,,20,6,TTATAAAAAATGCAGAAATTT,,
15 (GENBANK ACCESSION NO. AA486518)
GAAGATGAAGGTGTCTCTCAGAGGAAGTTTCTGGATGGCAACGAGCTCACCTGGCTGACTGCAACCTGTTGCCAAAGTTACACAT
AGTACAGGTGGTGTGTAAGAAAGTACCGGGGATTCCACATCCCGAGGCCTTCCGGGGAGTGCATCGGTACTTGAGCAATGCCTACG
CCCGGGAAGAATTTCGCTTCCACCTGTCCAGATGATGAGGAGATCGAGCTCGCCTATGAGCAAGTGGCAAAGGCCCTCAAATAAGCC
CCTCCTGGGACTCCCTCAACCCCTCCATTTCTCCACAAAGGCCCTGGTGGTTCCACATTGCTACCCAATGGACACACTCCAAAA
20 TGGCCAGTGGGCAAGGAATCTCGAGCATTGTTCCGGGATGGTGGTGGAGAGGGGATGAGGGAAAGAAATGGGGGGCCTGG
GTCAGATTTTATTGTGGGGTGGGATGAGTAGGACAACATATTTCAGTAATAAAAATACAGAATAAAAATC
(SEQ ID NO: 6096)

6097,AA486518,,20,481,GATTTTTATTCTGTATTTA,,
25 6098,AA486518,,20,475,TATTCTGTATTTATTACTG,,
6099,AA486518,,20,469,GTATTTTATTACTGAAATAT,,
6100,AA486518,,20,463,TATTACTGAAATATGTTGTC,,
6101,AA486518,,20,457,TGAAATATGTTGTCTACTC,,
6102,AA486518,,20,451,ATGTTGTCTACTCATCCCA,,
30 6103,AA486518,,20,445,TCCTACTCATCCACCCAC,,
6104,AA486518,,20,439,TCATCCCAACCCACAATAAA,,
6105,AA486518,,20,433,CACCCACAATAAAAATCTG,,
6106,AA486518,,20,427,ACAATAAAAATCTGACCCAG,,
6107,AA486518,,20,421,AAAATCTGACCCAGGCCCCC,,
35 6108,AA486518,,20,415,TGACCCAGGCCCCCATTT,,
6109,AA486518,,20,409,AGGCCCCCATTTCTTTCCC,,
6110,AA486518,,20,403,CCCATTTCTTTCCCTCATCC,,
6111,AA486518,,20,397,TCTTTCCCTCATCCCTCTT,,
6112,AA486518,,20,391,CCTCATCCCTCTTCCACCA,,
40 6113,AA486518,,20,385,CCCTCTTCCACCACCAT,,
6114,AA486518,,20,379,TTCCACCACCATCCCGGA,,
6115,AA486518,,20,373,CACACCATCCCGGAACAAGT,,
6116,AA486518,,20,367,ATCCCGGAACAAGTGCTCCA,,
6117,AA486518,,20,361,GAACAAGTGCTCCAGGATTC,,
45 6118,AA486518,,20,355,GTGCTCCAGGATTCCTGCC,,
6119,AA486518,,20,349,CAGGATTCCTGCCCACTGG,,
6120,AA486518,,20,343,TCCCTGCCCACTGGCCATT,,
6121,AA486518,,20,337,CCCACTGGCCATTTGGAGT,,
6122,AA486518,,20,331,GGCCATTTGGAGTGTGTCC,,
50 6123,AA486518,,20,325,TTGGAGTGTGTCCATTGGG,,
6124,AA486518,,20,319,GTGTGTCCATTGGGTAGCAA,,
6125,AA486518,,20,313,CCATTGGGTAGCAATGTGGA,,
6126,AA486518,,20,307,GTAGCAATGTGGAACCAC,,
6127,AA486518,,20,301,AAATGTGGAACCACAGGGC,,
55 6128,AA486518,,20,295,GAAACCACAGGGCCTTTGT,,
6129,AA486518,,20,289,ACCAGGGCCTTTGTGGAGAA,,
6130,AA486518,,20,283,GCCTTTGTGGAGAAAATGGA,,
6131,AA486518,,20,277,GTGGAGAAAATGGAGGGGT,,
6132,AA486518,,20,271,AAAATGGAGGGGTTGAGGG,,
60 6133,AA486518,,20,265,GAGGGGTTGAGGGAGTCCC,,
6134,AA486518,,20,259,GTGAGGGAGTCCCAGGAGG,,
6135,AA486518,,20,253,GGAGTCCCAGGAGGGCTTA,,
6136,AA486518,,20,247,CCAGGAGGGCTTATTTGAG,,
6137,AA486518,,20,241,GGGGCTTATTTGAGGGCCTT,,
65 6138,AA486518,,20,235,TATTTGAGGGCCTTTGCCAC,,
6139,AA486518,,20,229,AGGGCCTTTGCCACTTGCTC,,
6140,AA486518,,20,223,TTGCCACTTGCTCATAGGC,,
6141,AA486518,,20,217,ACTTGCTCATAGGGAGGCTC,,
6142,AA486518,,20,211,TCATAGGCGAGCTCGATCTC,,
70 6143,AA486518,,20,205,GCGAGCTCGATCTCCTCATC,,
6144,AA486518,,20,199,TCGATCTCCTCATCATCTGG,,
6145,AA486518,,20,193,TCCTCATCATCTGGACAGGT,,
6146,AA486518,,20,187,TCATCTGGACAGGTGGAAGC,,
6147,AA486518,,20,181,GGACAGGTGGAAGCGAATTC,,
75 6148,AA486518,,20,175,GTGGAAGCGAATCTTCCCG,,

6149,AA486518,,20,169,GCGAATTCTTCCCGGGCGTA,,
6150,AA486518,,20,163,TCITCCCGGGCGTAGGCATT,,
6151,AA486518,,20,157,CGGGCGTAGGCATTGCTCAA,,
6152,AA486518,,20,151,TAGGCATTGCTCAAGTACCG,,
5 6153,AA486518,,20,145,TTGCTCAAGTACCGATGCAC,,
6154,AA486518,,20,139,AAGTACCGATGCACTCCCCG,,
6155,AA486518,,20,133,CGATGCACTCCCCGGAAGGC,,
6156,AA486518,,20,127,ACTCCCCGGAAGGCCTCGGG,,
6157,AA486518,,20,121,CGGAAGGCCTCGGGGATGGT,,
10 6158,AA486518,,20,115,GCCTCGGGGATGGTGAATCC,,
6159,AA486518,,20,109,GGGATGGTGAATCCCCGGTA,,
6160,AA486518,,20,103,GTGAATCCCCGGTACTTCTT,,
6161,AA486518,,20,97,CCCCGGTACTTCTTACACAC,,
6162,AA486518,,20,91,TACTTCTTACACACCACTG,,
15 6163,AA486518,,20,85,TTACACACCACCTGTACTAT,,
6164,AA486518,,20,79,ACCACCTGTACTATGTGTAA,,
6165,AA486518,,20,73,TGTACTATGTGTAACTTTGG,,
6166,AA486518,,20,67,ATGTGTAACTTTGGCAACAG,,
6167,AA486518,,20,61,AACTTTGGCAACAGGTTGCA,,
20 6168,AA486518,,20,55,GGCAACAGGTTGCAGTCAGC,,
6169,AA486518,,20,49,AGGTTGCAGTCAGCCAGGGT,,
6170,AA486518,,20,43,CAGTCAGCCAGGGTGAGCTC,,
6171,AA486518,,20,37,GCCAGGGTGAGCTCGTTGCC,,
6172,AA486518,,20,31,GTGAGCTCGTTGCCATCCAG,,
25 6173,AA486518,,20,25,TCGTTGCCATCCAGAACTT,,
6174,AA486518,,20,19,CCATCCAGAACTTCTCTCTG,,
6175,AA486518,,20,13,AGAACTTCTCTGAGAGAC,,
6176,AA486518,,20,7,TTCTCTGAGAGACACCTTC,,
6177,AA486518,,20,1,TGAGAGACACCTTCATCTTC,,
30 (GENBANK ACCESSION NO. AA464729)
TCTGCTTTCCCACTTTATTTAGAAAAACAAATCCAGGTCCCATGGCCAAGAAGCATGTGCGCAGCGCGATAAGAAGCTGGCGGC
CAAGAAAAAGACGGACAAGAAGCGGGCGCTGCGGGGCTGTAGTGGGCTCTCTTCTCTCCACCGTGACCCCAACCTCTCTCTGTC
CCCTCCCTCAACTCTGTCTCTAAGTT
(SEQ ID NO: 6178)
35 6179,AA464729,,20,180,AACTTAGAGACAGAGTTGGA,,
6180,AA464729,,20,174,GAGACAGAGTTGGAGGGAGG,,
6181,AA464729,,20,168,GAGTTGGAGGGAGGGACAG,,
6182,AA464729,,20,162,GAGGGAGGGGACAGGAGAGG,,
40 6183,AA464729,,20,156,GGGGACAGGAGAGGTTGGGG,,
6184,AA464729,,20,150,AGGAGAGGTTGGGGTCACGG,,
6185,AA464729,,20,144,GGTTGGGGTCACGGTGGAA,,
6186,AA464729,,20,138,GGTCACGGTGGAAAGGAGGAA,,
6187,AA464729,,20,132,GGTGGAAAGGAGGAAGAGAGC,,
45 6188,AA464729,,20,126,AGGAGGAAGAGAGCCCACTA,,
6189,AA464729,,20,120,AAGAGAGCCCACTACAGCCC,,
6190,AA464729,,20,114,GCCCACTACAGCCCCGACG,,
6191,AA464729,,20,108,TACAGCCCCGACGCCCCG,,
6192,AA464729,,20,102,CCCGCAGCGCCCGCTTCTTG,,
50 6193,AA464729,,20,96,GCGCCCGCTTCTGTCCGTC,,
6194,AA464729,,20,90,GCTTCTTGTCCGCTTTTTTC,,
6195,AA464729,,20,84,TGTCCGCTTTTTTCTTGGCC,,
6196,AA464729,,20,78,TCTTTTCTTGGCCGCCAGC,,
6197,AA464729,,20,72,TCTTGGCCGCCAGCTTCTTA,,
55 6198,AA464729,,20,66,CCGCCAGCTTCTTATCGCGC,,
6199,AA464729,,20,60,GCTTCTTATCGCGCTCGCCA,,
6200,AA464729,,20,54,TATCGCGCTCGCCAGCATGC,,
6201,AA464729,,20,48,GCTCGCCAGCATGCTTCTTG,,
6202,AA464729,,20,42,CAGCATGCTTCTTGGCCATG,,
60 6203,AA464729,,20,36,GCTTCTTGGCCATGGGACCT,,
6204,AA464729,,20,30,TGGCCATGGGACCTGGATTT,,
6205,AA464729,,20,24,TGGGACCTGGATTTGTTTTT,,
6206,AA464729,,20,18,CTGGATTTGTTTTTCTAAAT,,
6207,AA464729,,20,12,TTGTTTTTCTAAATAAAGTT,,
65 6208,AA464729,,20,6,TTCTAAATAAAGTTGAAAAA,,
(GENBANK ACCESSION NO. AA180912)
GTGGTCGAGCCCTACAACCTATCCTGACCACCCACCAACCTGGAGCACTCAGACTGTGCCTTCATGGTGGACAACGAAGCAAT
CTATGACATCTGCCGCCGCAACCTAGACATCGAGCGCCCAACCTACACCAACCTCAATCGCCTCATTAGCCAAATTGTCTCTCCAT
CACAGCTTCTCTGCGCTTTGACGGGGCCCTCAATGTGGACCTGACAGAGTCCAGACCAACCTGGTGCCCTACCTCGCATCCACTT
70 CCCCCTGGCCACCTATGCAACCACTCTCTGCAAGAAAAGGCATACCAGAGCAGCTGTGCGGTGGCAGAGATCAACCAATGCCTGCT
TTTGAGCCTNCCAACAGANGGTAAAGTGTGATTCCCGG
(SEQ ID NO: 6209)
6210,AA180912,,20,366,CCGGAATCACACTTTACCN,,
75 6211,AA180912,,20,360,ATCACACTTTACCNCTGTGT,,

6212,AA180912,,20,354,CTTTACCNCTCTGGTTGGNAG,,
6213,AA180912,,20,348,CNTCTGGTTGGNAGGCTCAA,,
6214,AA180912,,20,342,GTTGGNAGGCTCAAAAGCAG,,
6215,AA180912,,20,336,AGGCTCAAAAGCAGGCATTG,,
5 6216,AA180912,,20,330,AAAAGCAGGCATTGGTGATC,,
6217,AA180912,,20,324,AGGCATTGGTGATCTCTGCC,,
6218,AA180912,,20,318,TGGTGATCTCTGCCACCGAC,,
6219,AA180912,,20,312,TCTCTGCCACCGACAGCTGC,,
6220,AA180912,,20,306,CCACCGACAGCTGCTCGTGG,,
10 6221,AA180912,,20,300,ACAGCTGCTCGTGGTATGCC,,
6222,AA180912,,20,294,GCTCGTGGTATGCCTTTTCT,,
6223,AA180912,,20,288,GGTATGCCTTTTCTGCAGAG,,
6224,AA180912,,20,282,CCTTTTTCTGCAGAGTGAAT,,
6225,AA180912,,20,276,CTGCAGAGATGACTGGTGCA,,
15 6226,AA180912,,20,270,AGATGACTGGTGATAGGTG,,
6227,AA180912,,20,264,CTGGTGATAGGTGGCCAGG,,
6228,AA180912,,20,258,CATAGGTGGCCAGGGGAAG,,
6229,AA180912,,20,252,TGGCCAGGGGAAGTGGATG,,
6230,AA180912,,20,246,GGGGGAAGTGGATGCCAGGG,,
20 6231,AA180912,,20,240,AGTGGATGCCAGGGTAGGGC,,
6232,AA180912,,20,234,TGCGAGGGTAGGGCACCAGG,,
6233,AA180912,,20,228,GGTAGGGCACCAGGTGGTC,,
6234,AA180912,,20,222,GCACCGAGTTGGTCTGGAAC,,
6235,AA180912,,20,216,GGTTGGTCTGGAACCTGTCT,,
25 6236,AA180912,,20,210,TCTGGAACCTGTCTCAGGTCC,,
6237,AA180912,,20,204,ACTCTGTCTCAGGTCCACATTG,,
6238,AA180912,,20,198,TCAGGTCCACATTGAGGGCC,,
6239,AA180912,,20,192,CCACATTGAGGGCCCGTCA,,
6240,AA180912,,20,186,TGAGGGCCCGTCAAGCGC,,
30 6241,AA180912,,20,180,CCCCGTCAAGCGCAGAGAA,,
6242,AA180912,,20,174,CAAAGCGCAGAGAAAGCTGTG,,
6243,AA180912,,20,168,GCAGAGAAAGCTGTGATGGAG,,
6244,AA180912,,20,162,AAGCTGTGATGGAGGAGACA,,
6245,AA180912,,20,156,TGATGGAGGAGACAATTGG,,
35 6246,AA180912,,20,150,AGGAGACAATTGGCTAATG,,
6247,AA180912,,20,144,CAATTGGCTAATGAGGCGA,,
6248,AA180912,,20,138,GGCTAATGAGCGATTGAGG,,
6249,AA180912,,20,132,TGAGGCGATTGAGGTGGTG,,
6250,AA180912,,20,126,GATTGAGGTGGTGTAGGTT,,
40 6251,AA180912,,20,120,GGTTGGTGTAGGTTGGGCGC,,
6252,AA180912,,20,114,TGTAGGTGGGCGCTCGATG,,
6253,AA180912,,20,108,TTGGGCGCTCGATGCTAGG,,
6254,AA180912,,20,102,GCTCGATGCTAGGTTGCGG,,
6255,AA180912,,20,96,TGTCTAGGTTGCGGCGGCAG,,
45 6256,AA180912,,20,90,GGTTGCGGCGGCAGATGTCA,,
6257,AA180912,,20,84,GCCGGCAGATGTCATAGATT,,
6258,AA180912,,20,78,AGATGTCATAGATTGCTTCG,,
6259,AA180912,,20,72,CATAGATTGCTTCGTTGTCC,,
6260,AA180912,,20,66,TGCTTCGTTGTCCACCATG,,
50 6261,AA180912,,20,60,CGTTGTCCACCATGAAGGCA,,
6262,AA180912,,20,54,CCACCATGAAGGCACAGTCT,,
6263,AA180912,,20,48,TGAAGGCACAGTCTGAGTGC,,
6264,AA180912,,20,42,CACAGTCTGAGTGTCCAGG,,
6265,AA180912,,20,36,CTGAGTGTCCAGGGTGGTG,,
55 6266,AA180912,,20,30,GCTCCAGGGTGGTGTGGGTG,,
6267,AA180912,,20,24,GGGTGGTGTGGGTGGTCAGG,,
6268,AA180912,,20,18,TGTGGGTGGTCAAGGATAGAG,,
6269,AA180912,,20,12,TGGTCAGGATAGAGTTGTAG,,
6270,AA180912,,20,6,GGATAGAGTTGTAGGGCTCG,,
60 (GENBANK ACCESSION NO. AA436142)
TGCAGACAAAGTAAATTTATTGAGACAGACAGAAATGCACCTACTCAGGACTACAGTTAAGCATTACTATTAACCAAGAGTTG
TGTTTCACATTCAGATAAGTCTACGTGGAAAAGCATTCAAGATTTACTAGGTTTTGCTACATCACTATTCATCTACAATAGGGACA
ACAAACTGACACTCAGGATTTGATGGGCTCTCATTAACAATGCTATACATTTAACAGGAACAAACATCAAGTACTTTGAGAAAAAGTT
ATAAAAAGACCAAAACCCCACTGTAGAATGGGCTCTTGGATGTTACTGTACAGCGTGGTCAAGGTAACAAGAAAAAATGT
65 GAGTGGCATCTGGGATGAGCCGGGGGACAGACCTGGACAGACACGTTGTCAATTTGCTGCTGTGGGTAGGAAAAATGGGCGTAAAGG
AGGAGAAAACAGATA
(SEQ ID NO: 6271)
6272,AA436142,,20,428,TATCTGTTTCTCCTCCTTTA,,
6273,AA436142,,20,422,TTTCTCCTCCTTTACGCCCA,,
6274,AA436142,,20,416,CTCCTTTACGCCCATTTTCC,,
6275,AA436142,,20,410,TACGCCCATTTTCTACCCA,,
6276,AA436142,,20,404,CATTTTCTACCCACAGCAG,,
6277,AA436142,,20,398,CCTACCCACAGCAGCAATG,,
75 6278,AA436142,,20,392,CACAGCAGCAATGACAACG,,

6279,AA436142,,20,386,AGCAAATGACAACGTGTCTG,,
6280,AA436142,,20,380,TGACAACGTGTCTGTCCAGG,,
6281,AA436142,,20,374,CGTGTCTGTCCAGGTCTGTG,,
5 6282,AA436142,,20,368,TGTCCAGGTCTGTCCCCCGG,,
6283,AA436142,,20,362,GGTCTGTCCCCCGGCTCATC,,
6284,AA436142,,20,356,TCCCCCGGCTCATCCAGGA,,
6285,AA436142,,20,350,GGCTCATCCAGGATGCCAC,,
6286,AA436142,,20,344,TCCCAGGATGCCACTCACAT,,
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10 6288,AA436142,,20,332,ACTCACATTTTCTCTCT,,
6289,AA436142,,20,326,ATTTTCTCTCTTGTACC,,
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15 6293,AA436142,,20,302,CCACGCTGTACAGTAACATC,,
6294,AA436142,,20,296,TGTACAGTAACATCCAAGAG,,
6295,AA436142,,20,290,GTAACATCCAAGAGCCCAATT,,
6296,AA436142,,20,284,TCCAAGAGCCCAATTCTACAG,,
6297,AA436142,,20,278,AGCCCAATTCTACAGTGGGTG,,
20 6298,AA436142,,20,272,TTCTACAGTGGGTGGTTTIG,,
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6300,AA436142,,20,260,TGGTTTGGTCTTTTATAA,,
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25 6303,AA436142,,20,242,AACTTTTCTCAAAGTCACT,,
6304,AA436142,,20,236,TTCTCAAAGTCACTGATGT,,
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30 6308,AA436142,,20,212,CCTGTAAATGTATAGCATT,,
6309,AA436142,,20,206,AAATGTATAGCATTGTAATG,,
6310,AA436142,,20,200,ATAGCATTGTAATGAGAGCC,,
6311,AA436142,,20,194,TTGTAATGAGAGCCCATCAA,,
6312,AA436142,,20,188,TGAGAGCCCATCAAATCCTG,,
35 6313,AA436142,,20,182,CCCATCAAATCCTGAGTGTG,,
6314,AA436142,,20,176,AAATCCTGAGTGTAGTTTG,,
6315,AA436142,,20,170,TGAGTGTAGTGTGTGTTC,,
6316,AA436142,,20,164,TCAGTTTGTGTGTCTTATG,,
6317,AA436142,,20,158,TGTTGTCCCTATTGTAGATG,,
40 6318,AA436142,,20,152,CCCTATTGTAGATGAAATAG,,
6319,AA436142,,20,146,TGTAGATGAAATAGTATGT,,
6320,AA436142,,20,140,TGAAATAGTATGTAGCAAA,,
6321,AA436142,,20,134,AGTGATGTAGCAAAACCTA,,
6322,AA436142,,20,128,GTAGCAAAACCTAGTAAAT,,
45 6323,AA436142,,20,122,AAAACCTAGTAAATCTGAA,,
6324,AA436142,,20,116,TAGTAAATCTGAATGCTTT,,
6325,AA436142,,20,110,ATTCTGAATGCTTTCCACG,,
6326,AA436142,,20,104,AATGCTTTTCCACGTAGACT,,
6327,AA436142,,20,98,TTTCCACGTAGACTTATCTG,,
50 6328,AA436142,,20,92,CGTAGACTTATCTGGAATGT,,
6329,AA436142,,20,86,CTTATCTGGAATGTGAACAC,,
6330,AA436142,,20,80,TGGAATGTGAACACAACCTCT,,
6331,AA436142,,20,74,GTGAACACAACCTCTTGGTT,,
6332,AA436142,,20,68,ACAACCTCTTGGTTAATAGT,,
55 6333,AA436142,,20,62,CTTGGTTAATAGTAAATGC,,
6334,AA436142,,20,56,TTAATAGTAAATGCTTAACT,,
6335,AA436142,,20,50,GTAAATGCTTAACTGTAGTC,,
6336,AA436142,,20,44,GCTTAACTGTAGTCCTGAGT,,
6337,AA436142,,20,38,CTGTAGTCCTGAGTAGGTGC,,
60 6338,AA436142,,20,32,TCCTGAGTAGGTGCATTTCT,,
6339,AA436142,,20,26,GTAGGTGCATTTCTGTCTGT,,
6340,AA436142,,20,20,GCATTTCTGTCTGTCTCAAT,,
6341,AA436142,,20,14,CTGTCTGTCTCAATAAATTT,,
6342,AA436142,,20,8,GTCTCAATAAATTTACTTT,,
65 6343,AA436142,,20,2,ATAAATTTTACTTTGTCTGC,,
(GENBANK ACCESSION NO. H05893)
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AGAAGTCTGCAGCCGTGTCCACCCTTGGCAGCAGGATGCATGTCTGTGATAACATCAGCTGCAGTTCAGAGCCCCCTGGTGGTCA
TTAGAGATCATAAATTGGGGTCTTCCGAAGATTAAACAAAACCTTCCAGAAATGGGGGTAACAGGAAGAAAACCTCAGTGGCCAA
70 CTGCCCGTCCCCGTGGGGCCAAACAACACTGGGGTGTATGCGTCTGGAACCCCTGTGATAGTCTTCGNNTTGCCAGCCTGGGGCCACC
ACATCCACTGCCTGGGGCCACACGACAGACACTGGGCAATGGGGCCGAGTTTCTCATCAACGTAACACAGGCATTTCCGGGGGT
(SEQ ID NO: 6344)
6345,H05893,,20,414,ACCCCCGAAATGCCTGGTTT,,
75 6346,H05893,,20,408,GAAATGCCTGGTTTACGTTT,,

6347,H05893,,20,402,CCTGGTTTACGTTTGTATGAG,,
6348,H05893,,20,396,TTACGTTTGTATGAGGAAACT,,
6349,H05893,,20,390,TTGATGAGGAAACTGCGGCC,,
6350,H05893,,20,384,AGGAACTGCGGCCCATTCG,,
5 6351,H05893,,20,378,CTGCGGCCCATTCGCCAGTG,,
6352,H05893,,20,372,CCCATTCGCCAGTGTCTGTC,,
6353,H05893,,20,366,GCCCAAGTGTCTGTCCGTGTG,,
6354,H05893,,20,360,TGTCTGTCCGTGTGGGCCCA,,
6355,H05893,,20,354,TCCGTGTGGGCCCAGGCAGT,,
10 6356,H05893,,20,348,TGGGCCCAGGCAGTGGATGT,,
6357,H05893,,20,342,CAGGCAGTGGATGTGGTGGG,,
6358,H05893,,20,336,GTGGATGTGGTGGGCCCAGG,,
6359,H05893,,20,330,GTGGTGGGCCCAGGCTGGCA,,
6360,H05893,,20,324,GCCCCAGGCTGGCAANCCGA,,
15 6361,H05893,,20,318,GGCTGGCAANCCGAAGACTA,,
6362,H05893,,20,312,CAANCCGAAGACTATCACAG,,
6363,H05893,,20,306,GAAGACTATCACAGGGTTCC,,
6364,H05893,,20,300,TATCACAGGGTTCCAGACGC,,
6365,H05893,,20,294,AGGGTTCCAGACGCATACAA,,
20 6366,H05893,,20,288,CCAGACGCATACAACCCAG,,
6367,H05893,,20,282,GCATACAACCCAGTGTGT,,
6368,H05893,,20,276,AACCCAGTGTGTGGGCC,,
6369,H05893,,20,270,AGTGTGTGTGGGCCACGGGG,,
6370,H05893,,20,264,GTGGGCCACGGGGAACGGG,,
25 6371,H05893,,20,258,CCACGGGGAACGGGCAGAAT,,
6372,H05893,,20,252,GGAACGGGCAGAATTGGCCA,,
6373,H05893,,20,246,GGCAGAATTGGCCACTGAGG,,
6374,H05893,,20,240,ATTGGCCACTGAGGAGTTTC,,
6375,H05893,,20,234,CACTGAGGAGTTTCTTCCTG,,
30 6376,H05893,,20,228,GGAGTTTCTTCCTGTTACCC,,
6377,H05893,,20,222,TCTTCCTGTTACCCCATTC,,
6378,H05893,,20,216,TGTTACCCCATTCGGAAG,,
6379,H05893,,20,210,CCCCATTCGGAAGGTTTGG,,
6380,H05893,,20,204,TCTGGAAGGTTTGTAAATC,,
35 6381,H05893,,20,198,AGGTTTGTAAATCTTCGGA,,
6382,H05893,,20,192,TGTTAATCTTCGGAAGAACC,,
6383,H05893,,20,186,TCTTCGGAAGAACCCCAATT,,
6384,H05893,,20,180,GAAGAACCCCAATTATGATC,,
6385,H05893,,20,174,CCCCAATTATGATCTCTAAG,,
40 6386,H05893,,20,168,TTATGATCTCTAAGTGACCA,,
6387,H05893,,20,162,TCTCTAAGTGACCAACAGGG,,
6388,H05893,,20,156,ACTGACCACCAGGGGCTCTG,,
6389,H05893,,20,150,CACCAGGGGCTCTGAAGTGC,,
6390,H05893,,20,144,GGGCTCTGAAGTGCAGCTGA,,
45 6391,H05893,,20,138,TGAAGTGCAGCTGATGTTAT,,
6392,H05893,,20,132,GCAAGTGTATATCAGCAG,,
6393,H05893,,20,126,GATGTTATCAGCAGGACATG,,
6394,H05893,,20,120,ATCAGCAGGACATGCATCCT,,
6395,H05893,,20,114,AGGACATGCATCCTGCTGCC,,
50 6396,H05893,,20,108,TGCATCCTGCTGCCAAGGGT,,
6397,H05893,,20,102,CTGCTGCCAAGGGTGGACAC,,
6398,H05893,,20,96,CCAAGGGTGGACACGGCTGC,,
6399,H05893,,20,90,GTGGACACGGCTGCAGACTT,,
6400,H05893,,20,84,ACGGCTGCAGACTTCTGGGG,,
55 6401,H05893,,20,78,GCAGACTTCTGGGGGAATTG,,
6402,H05893,,20,72,TTCTGGGGGAATTGTCGCCT,,
6403,H05893,,20,66,GGGAATTGTCGCCTCCTGCT,,
6404,H05893,,20,60,TGTCGCCTCCTGCTCTTTG,,
6405,H05893,,20,54,CTCCTGCTCTTTGTTACTG,,
60 6406,H05893,,20,48,CTCTTTGTTACTGAGTGAG,,
6407,H05893,,20,42,TGTTACTGAGTGAGATAAGG,,
6408,H05893,,20,36,TGAGTGAGATAAGGTTGTT,,
6409,H05893,,20,30,AGATAAGGTTGTTCAATAAA,,
6410,H05893,,20,24,GGTTGTTCAATAAAGACTTT,,
65 6411,H05893,,20,18,TCAATAAAGACTTTATCCC,,
6412,H05893,,20,12,AAGACTTTATCCCCAAGGT,,
6413,H05893,,20,6,TTTATCCCCAAGGTNAAAAA,,
(GENBANK ACCESSION NO. H37989)
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70 AGAATTGTGTTTGTGCTGCCTCTATCTGTTTTTTGTTTTTCTTCTGGGGGGGGTCTAGAACAGTGCCTGGCACATAGTAGGCGCTCA
ATAAATACTGTGTTGTGTAATGTCTCCTCTCTCTTCCACTCTGGGAAACCTAGGTTTCTGCCAATCTGGGTGACCCGTATTTCTTTC
TGGTGCCCATTCATTTGTCCAGTTAATACTTCTCTTAAAAATCTCCAAGAAGCTGGGTCTCCAGATCCCATTTAGAACCAACCAG
GTGCTGAACACATGTAGATAATGGCCATCCTTAAGCCCAAAGTAGAAAAATGGTAGAAGNGTAGTGGGTAGAAGNCACTATAT
AAGGAAG
75 (SEQ ID NO: 6414)

6415,H37989,,20,425,CTTCCTTATATAGTGNCTTC,,
6416,H37989,,20,419,TATATAGTGNCTTCTACCCA,,
6417,H37989,,20,413,GTGNCTTCTACCCACTACNC,,
5 6418,H37989,,20,407,TCTACCCACTACNCTTCTAC,,
6419,H37989,,20,401,CACTACNCTTCTACCATTTT,,
6420,H37989,,20,395,NCTTCTACCATTTTCTACTT,,
6421,H37989,,20,389,ACCATTTTCTACITTTGGGCT,,
6422,H37989,,20,383,TTCTACTTTGGGCTTAGGAT,,
10 6423,H37989,,20,377,TTTGGGCTTAGGATGATGGC,,
6424,H37989,,20,371,CTTAGGATGATGGCCATTAT,,
6425,H37989,,20,365,ATGATGGCCATTATCTACAT,,
6426,H37989,,20,359,GCCATTATCTACATGTGTTT,,
6427,H37989,,20,353,ATCTACATGTGTTTTCAGCA,,
15 6428,H37989,,20,347,ATGTGTTTTCAGCACCTGGT,,
6429,H37989,,20,341,TTTCAGCACCTGGTTGGTTC,,
6430,H37989,,20,335,CACCTGGTTGGTTCTAAATG,,
6431,H37989,,20,329,GTGTTGTTCTAAATGGGATCT,,
6432,H37989,,20,323,TCTAAATGGGATCTGGAGAC,,
20 6433,H37989,,20,317,TGGGATCTGGAGACCCAGCT,,
6434,H37989,,20,311,CTGGAGACCCAGCTTCTTGG,,
6435,H37989,,20,305,ACCCAGCTTCTTGGAGATTT,,
6436,H37989,,20,299,CTTCTGGAGATTTTAAAG,,
6437,H37989,,20,293,GGAGATTTTAAAGAGGAAGT,,
25 6438,H37989,,20,287,TTTTAAGAGGAAGTATTAAC,,
6439,H37989,,20,281,GAGGAAGTATTAAGTGGACA,,
6440,H37989,,20,275,GTATTAAGTGGACAAATGGA,,
6441,H37989,,20,269,ACTGGACAAATGGAATGGGC,,
6442,H37989,,20,263,CAAAATGGAATGGGCACCCAGA,,
30 6443,H37989,,20,257,GAATGGGCACCCAGAAAGAAA,,
6444,H37989,,20,251,GCACCAGAAAGAAATACAGG,,
6445,H37989,,20,245,GAAAGAAATACAGGGTCACC,,
6446,H37989,,20,239,AATACAGGGTCACCCAGAAT,,
6447,H37989,,20,233,GGGTCACCCAGAATGGCAGA,,
35 6448,H37989,,20,227,CCCAGAATGGCAGAAACCTA,,
6449,H37989,,20,221,ATGGCAGAAACCTAGGTTTC,,
6450,H37989,,20,215,GAAACCTAGGTTTCCAGAG,,
6451,H37989,,20,209,TAGGTTTCCAGAGTGGAAG,,
6452,H37989,,20,203,TCCAGAGTGGAAGAGAGA,,
40 6453,H37989,,20,197,AGTGGAAAGAGAGAGGAGAC,,
6454,H37989,,20,191,AAGAGAGAGGAGACATTCAA,,
6455,H37989,,20,185,GAGGAGACATTCAACAAACA,,
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6457,H37989,,20,173,AACAAACAAGTATTTATTGA,,
45 6458,H37989,,20,167,CAAGTATTTATTGAGCGCCT,,
6459,H37989,,20,161,TTTATTGAGCGCCTACTATG,,
6460,H37989,,20,155,GAGCGCCTACTATGTGCCAG,,
6461,H37989,,20,149,CTACTATGTGCCAGGCACTG,,
6462,H37989,,20,143,TGTGCCAGGCACTGTTCTAG,,
50 6463,H37989,,20,137,AGGCACTGTTCTAGACCCCC,,
6464,H37989,,20,131,TGTTCTAGACCCCCCAGA,,
6465,H37989,,20,125,AGACCCCCCAGAAAGAAA,,
6466,H37989,,20,119,CCCCAGAAAGAAAAACAAA,,
6467,H37989,,20,113,GAAGAAAAACAAAAACAA,,
55 6468,H37989,,20,107,AAAAACAAAAACAAAGATAGA,,
6469,H37989,,20,101,AAAAACAAGATAGAGGCAGC,,
6470,H37989,,20,95,AAGATAGAGGCAGCAAAACAC,,
6471,H37989,,20,89,GAGGCAGCAAAACACAAATTC,,
6472,H37989,,20,83,GCAAACACAAATTCGAGGG,,
60 6473,H37989,,20,77,ACAAATTCGAGGGAGAGGA,,
6474,H37989,,20,71,TCTGAGGGAGAGGAAAGGGG,,
6475,H37989,,20,65,GGAGAGGAAAGGGGTAGTTG,,
6476,H37989,,20,59,GAAAGGGGTAGTTGAGTAAG,,
6477,H37989,,20,53,GGTAGTTGAGTAAGACGGCT,,
65 6478,H37989,,20,47,TGAGTAAGACGGCTAAGGGA,,
6479,H37989,,20,41,AGACGGCTAAGGGAAGTACG,,
6480,H37989,,20,35,CTAAGGGAAGTGAAGGCCT,,
6481,H37989,,20,29,GAAGTGAAGGCCTGAGGTG,,
6482,H37989,,20,23,AGAAGCCTGAGGTGATGGGG,,
70 6483,H37989,,20,17,CTGAGGTGATGGGGCTCTNC,,
6484,H37989,,20,11,TGATGGGGCTCTNCTTAGGC,,
6485,H37989,,20,5,GGCTCTNCTTAGGCCTCCNC,,
(GENBANK ACCESSION NO. AA486238)
AAAGGGGACACCTAGTTTGGTTGTCTTTGGCAAAGGAGATGACTTAAATCCGCTTAATCTCTCCAGTGTCGGTGTTAATGTATTT
75 GGCTATTAGATCACTAGCACTGCTTACCGCTCCTCATCGCCAACACCCCATGCTCTGTGGCCTTCTTACACTTCTCAGAGGGCAGA

GTGGCAGCCGGGCACCCTACAGAACTCAGAGGGCAGAGTGGCAGCCAGGCCACATGTCTCTCAAGTACCTGTCCCTCGCTCTG
GTGATTATTTCTTGCAATCACCACACGAGACCATCCCGGCAGTCATGGTTTTGCTTTAGTTTTCCAAGTCCGTTTCAGTCCCTTC
TTGGTCTGAAGAAATTCTGCAGTGGCGAGCAGTTTCCCACTTGCCAAGATCCCTTTT
(SEQ ID NO: 6486)

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6487,AA486238,,20,388,AAAAGGGATCTTGGCAAGTG,,
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6489,AA486238,,20,376,GGCAAGTGGGAAACTGCTCG,,
10 6490,AA486238,,20,370,TTGGGAACTGCTCGCCACTG,,
6491,AA486238,,20,364,ACTGCTCGCCACTGCAGAAT,,
6492,AA486238,,20,358,CGCCACTGCAGAATTTCTTC,,
6493,AA486238,,20,352,TGCAGAATTTCTTCAGACCA,,
6494,AA486238,,20,346,ATTTCTTCAGACCAAGGAAG,,
6495,AA486238,,20,340,TCAGACCAAGGAAGGGACTG,,
15 6496,AA486238,,20,334,CAAGGAAGGGACTGAAACGG,,
6497,AA486238,,20,328,AGGGACTGAAACGGACTTGG,,
6498,AA486238,,20,322,TGAAACGGACTTGGAAAAC,,
6499,AA486238,,20,316,GGACTTGGAAAACATAAGCA,,
6500,AA486238,,20,310,GGAAAACATAAGCAAAACCA,,
20 6501,AA486238,,20,304,CTAAAGCAAAACCATGACTG,,
6502,AA486238,,20,298,CAAAACCATGACTGCCGGGA,,
6503,AA486238,,20,292,CATGACTGCCGGGATGGTCT,,
6504,AA486238,,20,286,TGCCGGGATGGTCTCGTGTG,,
6505,AA486238,,20,280,GATGGTCTCGTGTGGTGATT,,
25 6506,AA486238,,20,274,CTCGTGTGGTGATTCTGCAA,,
6507,AA486238,,20,268,TGGTGATTCTGCAAGAAATA,,
6508,AA486238,,20,262,TTCTGCAAGAAATAATCACC,,
6509,AA486238,,20,256,AAGAAATAATCACCAGAGCG,,
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30 6511,AA486238,,20,244,CCAGAGCGAGGGGACAGGTA,,
6512,AA486238,,20,238,CGAGGGGACAGGTACTTGAG,,
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35 6516,AA486238,,20,214,ATGTGGGCCTGGCTGCCACT,,
6517,AA486238,,20,208,GCCTGGCTGCCACTCTGCC,,
6518,AA486238,,20,202,CTGCCACTCTGCCCTCTGAG,,
6519,AA486238,,20,196,CTCTGCCCTCTGAGTTTCTG,,
6520,AA486238,,20,190,CCTCTGAGTTTCTGTAGGGT,,
40 6521,AA486238,,20,184,AGTTTCTGTAGGGTGCCCGG,,
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6523,AA486238,,20,172,GTGCCCGCTGCCACTCTGC,,
6524,AA486238,,20,166,GGCTGCCACTCTGCCCTCTG,,
6525,AA486238,,20,160,CACTCTGCCCTCTGAGAAGT,,
45 6526,AA486238,,20,154,GCCCTCTGAGAAGTGTAAGA,,
6527,AA486238,,20,148,TGAGAAGTGTAAGAAGGCCA,,
6528,AA486238,,20,142,GTGTAAGAAGGCCACAGAGC,,
6529,AA486238,,20,136,GAAGGCCACAGAGCATGGGG,,
6530,AA486238,,20,130,CACAGAGCATGGGGGTGTTG,,
50 6531,AA486238,,20,124,GCATGGGGGTGTTGGCGATG,,
6532,AA486238,,20,118,GGGTGTTGGCGATGAGGAGC,,
6533,AA486238,,20,112,TGGCGATGAGGAGCGGTAAA,,
6534,AA486238,,20,106,TGAGGAGCGGTAAAGCAGTG,,
6535,AA486238,,20,100,GCGGTAAAGCAGTGCTAGTG,,
55 6536,AA486238,,20,94,AAGCAGTGCTAGTGATCTAA,,
6537,AA486238,,20,88,TGCTAGTGATCTAATAGCCA,,
6538,AA486238,,20,82,TGATCTAATAGCCAAATACA,,
6539,AA486238,,20,76,AATAGCCAAATACATTAACA,,
6540,AA486238,,20,70,CAAAATACATTAACACGGACA,,
60 6541,AA486238,,20,64,CATTAACACGGACACTGGAA,,
6542,AA486238,,20,58,CACGGACACTGGAAGAGATT,,
6543,AA486238,,20,52,CACTGGAAGAGATTAAGCGG,,
6544,AA486238,,20,46,AAGAGATTAAGCGGATTTTA,,
6545,AA486238,,20,40,TTAAGCGGATTTTAAGTCAT,,
65 6546,AA486238,,20,34,GGATTTTAAGTCATCTCCTT,,
6547,AA486238,,20,28,TAAGTCATCTCCTTTGCCAA,,
6548,AA486238,,20,22,ATCTCCTTTGCCAAATGACA,,
6549,AA486238,,20,16,TTTGCCAAATGACAACCAAA,,
6550,AA486238,,20,10,AAATGACAACCAAACTAGGT,,
70 6551,AA486238,,20,4,CAACCAAACTAGGTGTCCCC,,
(GENBANK ACCESSION NO. AA504461)
CCTGCCCTCTCTGTCCCGGCATTCAATTGACACGGGCTTTCCCTGGCCTGTGATCCCATCCCAACACACACGACAGAAAACAGTGC
AAAAATAAACAACAAATGCCAAATGTACACAGTGTACAACTCTGAAGTGAAGGAGAGACACGGGAATGGAAGTGGGT
AGGGGTGCGGAGGATGGGCACAGGCTGGTGTCTGACAGCCACACCTGGGTGCAAGCCACGTGTCTACGGCCAAGGTAACCG

GGTGTCTCAGGCACTTAATAAATATTAAGGGTGACCGGTGACTCAGGCTCTGCCTCTGGGAAOTGGCATCATTTGGTGAATGAGTTT
GGTCTCGGTGCCACC
(SEQ ID NO: 6552)

- 5 6553,AA504461,,20,340,GGTGGCACCGAGACCAAACCT,,
6554,AA504461,,20,334,ACCGAGACCAAACCTCATTCA,,
6555,AA504461,,20,328,ACCAAACCTCATTACCAAAT,,
6556,AA504461,,20,322,CTCATTACCAAATGATGCC,,
6557,AA504461,,20,316,CACCAAATGATGCCACTTCC,,
10 6558,AA504461,,20,310,ATGATGCCACTTCCCAGAGG,,
6559,AA504461,,20,304,CCACTTCCCAGAGGCAGAGC,,
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6561,AA504461,,20,292,GGCAGAGCCTGAGTCACCGG,,
6562,AA504461,,20,286,GCCTGAGTCACCGTCAACCC,,
15 6563,AA504461,,20,280,GTACCCGGTCACCCCTAATA,,
6564,AA504461,,20,274,GGTCACCCCTAATATTTATT,,
6565,AA504461,,20,268,CCTTAATATTTATTAAGTGC,,
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6567,AA504461,,20,256,TTAAGTGCCTGAGACACCCG,,
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6569,AA504461,,20,244,GACACCCGTTACCTTGGCC,,
6570,AA504461,,20,238,CGGTTACCTTGGCCGTGAGG,,
6571,AA504461,,20,232,CCTTGGCCGTGAGGACACGT,,
6572,AA504461,,20,226,CCGTGAGGACACGTGGCCTG,,
25 6573,AA504461,,20,220,GGACACGTGGCCTGCACCCA,,
6574,AA504461,,20,214,GTGGCCTGCACCCAGGTGTG,,
6575,AA504461,,20,208,TGCACCCAGGTGTGGCTGTC,,
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6577,AA504461,,20,196,TGGCTGTCAAGACACCAGCC,,
30 6578,AA504461,,20,190,TCAGGACACCAGCCTGGTGC,,
6579,AA504461,,20,184,CACCAAGCCTGGTGCCCATCC,,
6580,AA504461,,20,178,CCTGGTGCCCATCCTCCCGA,,
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45 6593,AA504461,,20,100,CTGTGTACATTTGGCATTG,,
6594,AA504461,,20,94,ACATTTGGCATTGTGTTAT,,
6595,AA504461,,20,88,GGCATTGTGTTATTATTT,,
6596,AA504461,,20,82,TGTGTTATTATTTGCACTG,,
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50 6598,AA504461,,20,70,TTGCACTGTTTCTGTCTGTG,,
6599,AA504461,,20,64,TGTTTCTGTCTGTGTGTT,,
6600,AA504461,,20,58,CTGTCTGTGTGTGTTGGGATG,,
6601,AA504461,,20,52,TGTGTGTTGGGATGGGATCA,,
6602,AA504461,,20,46,TTGGGATGGGATCACAGGCC,,
55 6603,AA504461,,20,40,TGGGATCACAGGCCAGGGAA,,
6604,AA504461,,20,34,CACAGGCCAGGGAAAGCCCG,,
6605,AA504461,,20,28,CCAGGAAAGCCCGTGTCAA,,
6606,AA504461,,20,22,AAAGCCCGTGTCAATGAATG,,
6607,AA504461,,20,16,CGTGTCAATGAATGCCGGGG,,
60 6608,AA504461,,20,10,AATGAATGCCGGGGACAGAG,,
6609,AA504461,,20,4,TGCCGGGGACAGAGAGGGGG,,
(GENBANK ACCESSION NO. AA448400)
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65 GAGCCTGACACCTCCACCTGCCACCCGCCCGGGGTGTAGTGGAACATGCAAAGCTCCGACGGTGGAGGCAGGGGTGGTCCGTGCTG
AGACCAGGGCTGGGTGCAACAGGAGGGTCAACAGAGCCTGGCTGGTGTCCCTGGGCCCAAAGGGGCTGGGGCTCCATGGGAGA
GAGACGGGCAGGGCGGCACCCAGTGTGGGGCTCCACAAGCTGGAGGGGGCCCTGGACCTACCAGGAGGACAGGTCTGCAGTTCCC
AGCCATGCCGGCTGGAACGTCGCCCTCCCACTGGGTCTGGGTCTCGGGGCTGGGGTTAGAGGCCGACATGGAAGGACTTACTA
GGGGAACAGAGGCTGGAGGCTGACGCC
(SEQ ID NO: 6610)
70 6611,AA448400,,20,437,GGCGTCAGCCTCCAGCCTCT,,
6612,AA448400,,20,431,AGCCTCCAGCCTCTGTTCCC,,
6613,AA448400,,20,425,CAGCCTCTGTTCCCTAGTA,,
6614,AA448400,,20,419,CTGTTCCCTAGTAAGTCCT,,
75 6615,AA448400,,20,413,CCCTAGTAAGTCCTTCCATG,,

6616,AA448400,,20,407,TAAGTCCTTCCATGTGCGGCC,,
6617,AA448400,,20,401,CTTCCATGTGCGGCTCTAAC,,
6618,AA448400,,20,395,TGTCGGCTCTAACCCAGG,,
6619,AA448400,,20,389,CCTCTAACCCAGGCCCGGA,,
5 6620,AA448400,,20,383,ACCCAGGCCCGAGGACCC,,
6621,AA448400,,20,377,GGCCCCGAGGACCCAGACCC,,
6622,AA448400,,20,371,GAGGACCCAGACCCAGTGGG,,
6623,AA448400,,20,365,CCAGACCCAGTGGGGAGGCG,,
6624,AA448400,,20,359,CCAGTGGGGAGGCGGACGTT,,
10 6625,AA448400,,20,353,GGGAGGCGGACGTTCCAGCC,,
6626,AA448400,,20,347,CGGACGTTCCAGCCGCGCATG,,
6627,AA448400,,20,341,TTCCAGCCGCGCATGGCTGGG,,
6628,AA448400,,20,335,CCGGCATGGCTGGGAACTGC,,
6629,AA448400,,20,329,TGGCTGGGAACTGCAGACCT,,
15 6630,AA448400,,20,323,GGAACTGCAGACCTGTCCTC,,
6631,AA448400,,20,317,GCAGACCTGTCCTGCTGTA,,
6632,AA448400,,20,311,CTGTCTCTGCTAGGTCCA,,
6633,AA448400,,20,305,TCCTGGTAGGTCCAGGGGCC,,
6634,AA448400,,20,299,TAGGTCCAGGGGCCCTCCA,,
20 6635,AA448400,,20,293,CAGGGGCCCTCCAGCTTGT,,
6636,AA448400,,20,287,CCCTCCAGCTTGTGGAGCC,,
6637,AA448400,,20,281,CAGCTTGTGGAGCCCCACAC,,
6638,AA448400,,20,275,GTGGAGCCCCACACTGGGGT,,
6639,AA448400,,20,269,CCCCACACTGGGGTGCCGCC,,
25 6640,AA448400,,20,263,ACTGGGGTGCCGCTGCCCC,,
6641,AA448400,,20,257,GTGCCGCTGCCGCTCTCTC,,
6642,AA448400,,20,251,CCTGCCGCTCTCTCTCCAT,,
6643,AA448400,,20,245,CGTCTCTCTCTCCATGGAGCC,,
6644,AA448400,,20,239,TCTCCCATGGAGCCCCAGCC,,
30 6645,AA448400,,20,233,ATGGAGCCCCAGCCCCTTG,,
6646,AA448400,,20,227,CCCCAGCCCCTTGGGCCCA,,
6647,AA448400,,20,221,CCCTTTGGGCCAGGGACA,,
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6649,AA448400,,20,209,CAGGGACACAGCCAGGCTC,,
35 6650,AA448400,,20,203,CACGACCCAGGCTCTGTGCT,,
6651,AA448400,,20,197,CCAGGCTCTGTGCTGACCTT,,
6652,AA448400,,20,191,TCTGTGCTGACCTCTCTGT,,
6653,AA448400,,20,185,CTGACCTCTCTGTGACCC,,
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40 6655,AA448400,,20,173,TTGACCCAGCCCTGCTCTC,,
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6657,AA448400,,20,161,CTGGTCTCAGCAGCGACCA,,
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6659,AA448400,,20,149,GCGACCAACCCCTGCTCCAC,,
45 6660,AA448400,,20,143,ACCCCTGCTTCCACCGTCGG,,
6661,AA448400,,20,137,GCCTCCACCGTCGGAGCTTT,,
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6664,AA448400,,20,119,TTGCATGTTCCACTACACC,,
50 6665,AA448400,,20,113,GTTCACCTACACCCGGGCG,,
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6667,AA448400,,20,101,CCCGGGCGGGTGGCAGGTGG,,
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55 6670,AA448400,,20,83,GGAGGTGTGAGGCTCTGGCG,,
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6672,AA448400,,20,71,CTCTGGCGCTCTGCAAGGG,,
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6674,AA448400,,20,59,TGCAAGGGCAGAACACTAAC,,
60 6675,AA448400,,20,53,GGCAGAACCTAACCTGACC,,
6676,AA448400,,20,47,ACACTAACCTGACCGTGGGC,,
6677,AA448400,,20,41,ACCTGACCGTGGCGGGGCT,,
6678,AA448400,,20,35,CCGTGGCGGGGCTTGCCTG,,
6679,AA448400,,20,29,GCGGGGCTTGCCTATCCGC,,
65 6680,AA448400,,20,23,CTTGGCGTATCCGCCCCAA,,
6681,AA448400,,20,17,GTATCCGCCCCCAATAAAG,,
6682,AA448400,,20,11,GCCCCCAATAAAGCAATT,,
6683,AA448400,,20,5,AATAAAGCAATTCCAACCT,,
(GENBANK ACCESSION NO. AA480815)
70 CGGCTCACCATGTGTCACTCTGCAAGCTGCCACCCGACCATGAACCTCTGCAAGGCCCCGACCCCGCCCCCTCCACCATCCCGGA
CCCCGGGTGTCCGCTGCTGAGATCTTACCTTCGACCTCTCCGGAGCCCGCAGCGCCCTGCGGGCGCCCCAGCGTCTCCGCG
GGCACCGAAAGCGCAGCGCAGGGTCTCTACCTCGAGTGGTCCGGCGCCAGTGCCTAGTCCGAGGAACCGAACCCAGCCAAAGG
CTTCTCTTCTGCTGCTACCATCGTCTTCTGCCAGATCCTGATGGCTGAAGAGGGTGTGCCGGC
(SEQ ID NO: 6684)
75

6685,AA480815,,20,305,GCCGGCACACCCCTCTTCAGC,,
6686,AA480815,,20,299,ACACCCCTCTTCAGCCATCAG,,
6687,AA480815,,20,293,TCTTCAGCCATCAGGATCTG,,
5 6688,AA480815,,20,287,GCCATCAGGATCTGGCAGAA,,
6689,AA480815,,20,281,AGGATCTGGCAGAAGACGAT,,
6690,AA480815,,20,275,TGGCAGAAGACGATGGTGAG,,
6691,AA480815,,20,269,AAGACGATGGTGAGCAGCAG,,
6692,AA480815,,20,263,ATGGTGAGCAGCAGAAAGAG,,
6693,AA480815,,20,257,AGCAGCAGAAAGAGAAGCCT,,
10 6694,AA480815,,20,251,AGAAAGAGAAGCCTTTTGGC,,
6695,AA480815,,20,245,AGAAAGCCTTTTGGCTGGGTT,,
6696,AA480815,,20,239,CTTTTGGCTGGGTTCCGGTTC,,
6697,AA480815,,20,233,GCTGGGTTCCGGTTCTCGAC,,
6698,AA480815,,20,227,TTCGGTTCTCGACTAGGCA,,
15 6699,AA480815,,20,221,TCCTCGACTAGGCACTGGCG,,
6700,AA480815,,20,215,ACTAGGCACTGGCGCCGGAC,,
6701,AA480815,,20,209,CACTGGCGCCGGACCACTCG,,
6702,AA480815,,20,203,CGCCGGACCACTCGAGGGTA,,
6703,AA480815,,20,197,ACCACTCGAGGGTAGAGAAC,,
20 6704,AA480815,,20,191,CGAGGGTAGAGAACCTGCG,,
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6707,AA480815,,20,173,CGCTGCGCTTTCGGTGCCCG,,
6708,AA480815,,20,167,GCTTTCGGTGCCCGCGANGA,,
25 6709,AA480815,,20,161,GGTGCCCGCGANGACGCTGG,,
6710,AA480815,,20,155,CGCGANGACGCTGGGGCGCC,,
6711,AA480815,,20,149,GACGCTGGGGCGCCCGCAGG,,
6712,AA480815,,20,143,GGGGCGCCCGCAGGGCGCT,,
6713,AA480815,,20,137,CCCGCAGGGGCGCTGCGGGC,,
30 6714,AA480815,,20,131,GGGGCGCTGCGGGCTCCGGG,,
6715,AA480815,,20,125,CTGCGGGCTCCGGGAGAGGG,,
6716,AA480815,,20,119,GCTCCGGGAGAGGGTCGAAG,,
6717,AA480815,,20,113,GGAGAGGGTCGAAGGTGAAG,,
6718,AA480815,,20,107,GGTCGAAGGTGAAGATCTCA,,
35 6719,AA480815,,20,101,AGGTGAAGATCTCAGCGACC,,
6720,AA480815,,20,95,AGATCTCAGCGACCGGAGCA,,
6721,AA480815,,20,89,CAGCGACCGGAGCACGCGGG,,
6722,AA480815,,20,83,CCGGAGCACGCGGGGTCCCG,,
6723,AA480815,,20,77,CACGCGGGGTCCCGGGATGG,,
40 6724,AA480815,,20,71,GGGTCCCGGGATGGTGGAGG,,
6725,AA480815,,20,65,CGGGATGGTGGAGGGGGCCG,,
6726,AA480815,,20,59,GGTGGAGGGGGCCGGGGTCG,,
6727,AA480815,,20,53,GGGGGCGGGGTGCGGGGCT,,
6728,AA480815,,20,47,CGGGGTGCGGGGCTGCAGGA,,
45 6729,AA480815,,20,41,CGGGGCTGCAGGATGGTCA,,
6730,AA480815,,20,35,CTGCAGGATGGTCAATGGTCG,,
6731,AA480815,,20,29,GATGGTCATGGTGGGTGGC,,
6732,AA480815,,20,23,CATGGTCGGGTGGCAGCTGC,,
6733,AA480815,,20,17,CGGGTGGCAGCTGCGAGAGT,,
50 6734,AA480815,,20,11,GACAGCTGCGAGAGTGACACA,,
6735,AA480815,,20,5,GCGAGAGTGACACATGGTGA,,
(GENBANK ACCESSION NO. AA102454)
TGTGATTGCATGGGGTAACCNITTTATTTTATTTAAACAGTACATTTTGAAGAAGATAAGGCAACAAGGCAAAAATTTCTGTAATGTTG
CTAGCATTTTCCCAAGGTAAAGCCAGGAACAAACTTGTGTCTTTCTATAAGAACTTTAAAGTGATGTCCCTCTAACTCCATGGA
55 CAGACACTAGTGGTGGTGAAGTTCATAAAAGTTTTTGAGGTGGCAACAGCTTATTTTGTCTTTATCATAATTGGTTTACAAATTGG
ATGCTGTGTTTTGTCATACTGGTTCAGTTGATCAAGCGCAGGATCCCTTTTGGTCTTTGTAAGACCANGATGGTATAAGGCCGAATA
GGGGTCAAGAACTTGATTGTAAGGAGAACGATTTACTATTTACCCAATCAATATTCTACAAAACCTGTCTCTGGTTNAAACCAAGC
GACAGAGGTGAGTCTTCTCTCTGGACTCTCCAGATGCCTTGACAAGANTACTTCATGATATACCATGTTTCCAGTTGGGCTCATG
GGAAATGGGTAATCTTGGGACTGGTTGTTTGGGTAGAANAACAGCTGGCATTTTTTAACCTGGAAG
60 (SEQ ID NO: 6736)

6737,AA102454,,20,569,CTTCCAGGTTAAAAATGCCA,,
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6739,AA102454,,20,557,AAATGCCAGCTGTTNTTCTA,,
65 6740,AA102454,,20,551,CAGCTGTTNTTCTACCCAAA,,
6741,AA102454,,20,545,TTNTTCTACCCAAACAACCA,,
6742,AA102454,,20,539,TACCCAAACAACCAAGTCCCA,,
6743,AA102454,,20,533,AACAACCAAGTCCCAAGATTA,,
6744,AA102454,,20,527,CAGTCCCAAGATTACCCATT,,
70 6745,AA102454,,20,521,CAAGATTACCCATTCCCAT,,
6746,AA102454,,20,515,TACCCATTCCCATGAGCCC,,
6747,AA102454,,20,509,TTCCCATGAGCCCAACTGG,,
6748,AA102454,,20,503,ATGAGCCCAACTGGGAAACA,,
6749,AA102454,,20,497,CCAAGTGGGAAACATGGTAT,,
75 6750,AA102454,,20,491,GGGAAACATGGTATATCATG,,

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6772,AA102454,,20,359,GTCTCCTTACAATCAAGTT,,
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25 6775,AA102454,,20,341,TTCTTGACCCCTATTCGGCC,,
6776,AA102454,,20,335,ACCCCTATTCGGCCCTATAC,,
6777,AA102454,,20,329,ATTCGGCCCTATACCATCNT,,
6778,AA102454,,20,323,CCTTATACCATCNTGGTCTT,,
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30 6780,AA102454,,20,311,NTGGTCTTACAAAGACCAA,,
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40 6790,AA102454,,20,251,CCAGGCATCCAATTGTAAA,,
6791,AA102454,,20,245,ATCCAATTGTAAACCAATT,,
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6793,AA102454,,20,233,AACCAATTATGATAAAGGAC,,
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6796,AA102454,,20,215,ACAAATAAGCTGTTGCCA,,
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55 6805,AA102454,,20,161,TGTCTGTCCATGGAGTTAGA,,
6806,AA102454,,20,155,TCCATGGAGTTAGAGGGGAC,,
6807,AA102454,,20,149,GAGTTAGAGGGGACATCACT,,
6808,AA102454,,20,143,GAGGGGACATCACTTAGAAG,,
6809,AA102454,,20,137,ACATCACTTAGAAGTTCTTA,,
60 6810,AA102454,,20,131,CTTAGAAGTTCTTATAGAAA,,
6811,AA102454,,20,125,AGTTCTTATAGAAAGGACAC,,
6812,AA102454,,20,119,TATAGAAAGGACACAAGTTT,,
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6814,AA102454,,20,107,ACAAGTTTGTTCCTGGCTT,,
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6816,AA102454,,20,95,CCTGGCTTACCTTGGGAAA,,
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6818,AA102454,,20,83,TTGGGAAAATGCTAGCAACA,,
6819,AA102454,,20,77,AAATGCTAGCAACATTACAG,,
70 6820,AA102454,,20,71,TAGCAACATTACAGAAATTT,,
6821,AA102454,,20,65,CATTACAGAAATTTGCCTT,,
6822,AA102454,,20,59,AGAAATTTGCCTTGTGCT,,
6823,AA102454,,20,53,TTTGCCTTGTGCTTATCT,,
6824,AA102454,,20,47,TTGTTGCCTTATCTTCTTCC,,
75 6825,AA102454,,20,41,CCTTATCTTCTTCAAATGT,,

6826,AA102454,,20,35,CTTCTTCCAAATGTACTGTT,,
6827,AA102454,,20,29,CCAAATGTACTGTTAAATAA,,
6828,AA102454,,20,23,GTACTGTTAAATAAAAAATAA,,
6829,AA102454,,20,17,TTAAATAAAAAATAAANGGTT,,
5 6830,AA102454,,20,11,AAAAATAAANGGTTACCCCA,,
6831,AA102454,,20,5,AAANGGTTACCCCATGCAAT,,
(GENBANK ACCESSION NO. AA258396)
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10 GAGAAATAATGAATAAAATCTTAATGTTTTCCCTCCACGCCCTTTTTTATCTCCAAGATTAGGAATTAACCGGATTAGGTTTTT
GAAAAATAAAGTTTCCCTTTTGGAAAAATGGTCTACATTCAGAAATGTCTTAGAACCAAGCATTTAAAAAAAATAAATAATCATA
AATCAAAATACATTAATAAATAAATAACAGTACATCATCGCTCTAGAAAAATTCACCATAACAAGACGATCCTTTCAAAGGTTTCATAAA
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(SEQ ID NO: 6832)
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6836,AA258396,,20,385,CTGCATACCTTTTCATCACGA,,
6837,AA258396,,20,379,ACTTTTCATCACGATGCAGG,,
20 6838,AA258396,,20,373,CATCACGATGCAGGAAACGA,,
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6840,AA258396,,20,361,GGAAACGATTTTCGAGTCAAG,,
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25 6843,AA258396,,20,343,AGAAGACTTTTATTATGAA,,
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30 6848,AA258396,,20,313,GATCGTCTTGATGTTGAAT,,
6849,AA258396,,20,307,CTTGATGGTGAATTTTCTA,,
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40 6858,AA258396,,20,253,ATTTTGATTTATGATTATT,,
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6862,AA258396,,20,229,GTTTTTTTTTAAATGCTTGT,,
45 6863,AA258396,,20,223,TTTTAAATGCTTGTCTAAG,,
6864,AA258396,,20,217,ATGCTTGTCTAAGACATTT,,
6865,AA258396,,20,211,GTCTAAGACATTTCTGAAT,,
6866,AA258396,,20,205,AGACATTTCTGAATGTAGAC,,
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50 6868,AA258396,,20,193,ATGTAGACCATTTTCCAAAA,,
6869,AA258396,,20,187,ACCATTTTCCAAAAAGGAAA,,
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55 6873,AA258396,,20,163,ATTTTCAAAAACCTAATCCG,,
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60 6878,AA258396,,20,133,TAATCTTGGAGAATAAAAAA,,
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6880,AA258396,,20,121,ATAAAAAAGGCGGTGGAGG,,
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65 6883,AA258396,,20,103,GGGGAACATTAAAGAATT,,
6884,AA258396,,20,97,AACATTAAAGAATTTATTCAT,,
6885,AA258396,,20,91,AAGAATTATTTCATTATTTC,,
6886,AA258396,,20,85,TTATTCATTATTCTCGAGT,,
6887,AA258396,,20,79,ATTATTCTCGAGTACTTTC,,
70 6888,AA258396,,20,73,TCTCGAGTACTTTCAGAAAG,,
6889,AA258396,,20,67,GTAATTCAGAAAGTCTGAC,,
6890,AA258396,,20,61,TCAGAAAGTCTGACACTTTC,,
6891,AA258396,,20,55,AGTCTGACACTTTCATTGTT,,
6892,AA258396,,20,49,ACACTTTCATTGTTGTGCCA,,
75 6893,AA258396,,20,43,TCATTGTTGTGCCAGCTGGT,,

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6961,AA497002,,20,113,TATGCATACATATGTGTGTA,,
 6962,AA497002,,20,107,TACATATGTGTGTATATATG,,
 6963,AA497002,,20,101,TGTGTGTATATATGGTTTGG,,
 6964,AA497002,,20,95,TATATATGGTTTGTTCAGGT,,
 5 6965,AA497002,,20,89,TGGTTTTGTTCAGGTGTGTA,,
 6966,AA497002,,20,83,TGTCAGGTGTGTAATTTGC,,
 6967,AA497002,,20,77,GTGTGTAATTTGCAAATTG,,
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 25 CCGCTATGTCCAGAAAGGAGAATACAGAACGAATCCTGAAGACATCTACCCAGCAACCCCTACTGGATGATGACGTGAGCAGCGGC
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40 7066,AA282906,,20,20,CAGCGGCTCCGTCGAGAG,,
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50 CCGCAGCTCGGCCAGNCTCTGTCTCCTCAGCGCTCAAGCTCCTCGGTGCGCATAGGGCTCGCGCTCAGGCTGGGANGCAGCGCG
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65 7157,AA156940,,20,13,CCTTTTAAAAAATAAACTT,,
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70 TCCGCAGGACTGTCCACCTCCCCCAGAGACAAACAGAAATGCAAGACTGTACACGCGGCTAGGACTGTTCCACGGACACACGA
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40 7201,AA485272,,20,52,ATTTGGATAAAAGGAACCAA,,
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7205,AA485272,,20,28,CAACAATGCCATCACTGGA,,
45 7206,AA485272,,20,22,ATGCCATCACTGGAATTTCC,,
7207,AA485272,,20,16,TCACTGGAATTTCCACCCGC,,
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55 GGNITGTTTAAATTCACCNAGGCCCGCGGAAGTTTAGGAGANTTTNTTTTTTGGGTTTCCCTTAGATT
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7271,R19956,,20,119,CTCANCNGCCTCGGCTTGTC,,
7272,R19956,,20,113,GCCTCGGCTTGTCACATTTT,,
45 7273,R19956,,20,107,GCTTGTCACATTTTCTTGT,,
7274,R19956,,20,101,CACATTTTCTTGTCTTGCT,,
7275,R19956,,20,95,TTTCTTGTCTTGCTCTATCT,,
7276,R19956,,20,89,GTCTTGCTCTATCTTCTTT,,
7277,R19956,,20,83,CTCTATCTTCTTGGTCTG,,
50 7278,R19956,,20,77,CTTCTTGGTCTGCATTCA,,
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7280,R19956,,20,65,TGCATTACATTTGTTGTGC,,
7281,R19956,,20,59,CACATTGTTGTGCTGTAGG,,
7282,R19956,,20,53,TGTTGTGCTGTAGGAAGCTC,,
55 7283,R19956,,20,47,GCTGTAGGAAGCTCATCTCT,,
7284,R19956,,20,41,GGAAGCTCATCTCTCTATG,,
7285,R19956,,20,35,TCATCTCTCTATGTGCTGG,,
7286,R19956,,20,29,CTCCTATGTGCTGGCCTTGG,,
7287,R19956,,20,23,TGTGCTGGCCTTGGTGAGGT,,
60 7288,R19956,,20,17,GGCCTTGGTGAGGTTTGATC,,
7289,R19956,,20,11,GGTGAGGTTTGATCCGCATA,,
7290,R19956,,20,5,GTTTGATCCGCATAATCTGC,,
(GENBANK ACCESSION NO. AA463610)
AAACTAGGTAATAATTTGTTGTTGGTTCCTTTTAGACCACGGCTGCCCTTCCAACCCCATCTTGCTCTAATGATCAAAACATGCTTG
65 AATAACTGAGCTTAGAGTATACCTCCTATATGTCCATTTAAGTCAGGAGAGGGGGCGATATAGAGACTAAGGCACAAAATTTTGT
AAAACCTCAGAATATAACATGTAAATCCCATCTCTAGAAAGCCCATCTGTGCCAGAGGAAGGAAAGGAGGAAATTTCTTCTC
TTTAGGAGGCACAACAGTTCTCTTCTAGGATTTGTTTGGCTGACTGGCAGTAACCTAGTGAATTTTQAAAAGATGAGTAATTTCTT
GGCAACCTTCTCTCTCTTACTGAACACTCTCCACCTCTGGTGGTACCATTATTATAGAAGCCCTCTACAGCCTGACTTCTCT
CCAGCGGTCCAAAAGTTATCCCTCTTACCCCTCATCCAAAGTTCCCATCTTCAAGGACAGCTGCTGTGCATTAGATATTAGGGG
70 GGAAAGTCATCTGNTAATTTACACACTTGCAATTAAGTGGATATAACTCCTTAAGTCAAGGAGCTATGTCAATTTAGTGCTAACA
AAGTAGAAAAATAGCTCGAGTGAGTTCTAATGGTGG
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75 7293,AA463610,,20,623,ATTAGAACTCACTCGAGCTA,,
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7293,AA463610,,20,623,ATTAGAACTCACTCGAGCTA,,

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7295,AA463610,,20,611,TCGAGCTATTTTCTACTTT,,
7296,AA463610,,20,605,TATTTTCTACTTTGTTAGC,,
7297,AA463610,,20,599,TCTACTTTGTTAGCACTAAA,,
5 7298,AA463610,,20,593,TTGTTAGCACTAAATGACAT,,
7299,AA463610,,20,587,GCACTAAATGACATAGCTCC,,
7300,AA463610,,20,581,AATGACATAGCTCCCTGAGT,,
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10 7303,AA463610,,20,563,GTTAAGGAGTTATATCCAGT,,
7304,AA463610,,20,557,GAGTTATATCCAGTAATTCA,,
7305,AA463610,,20,551,TATCCAGTAATTCATGCAAG,,
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15 7308,AA463610,,20,533,AGTGTGTAATTANACAGAT,,
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7312,AA463610,,20,509,TTCCCCCTAATATCTAATG,,
20 7313,AA463610,,20,503,CCTAATATCTAATGCACAGC,,
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7315,AA463610,,20,491,TGCACAGCAGCTGTCCTGAA,,
7316,AA463610,,20,485,GCAGCTGTCCTGAAGGAGTG,,
7317,AA463610,,20,479,GTCTGAAGGAGTGCGAACT,,
25 7318,AA463610,,20,473,AAGGAGTGCGAACTTTGGAT,,
7319,AA463610,,20,467,TGCGAACTTTGGATGAGGGG,,
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30 7323,AA463610,,20,443,GGAGGGGATAACTTTGGACC,,
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35 7328,AA463610,,20,413,AAGTCAGGCTGTAGAGGGCT,,
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7330,AA463610,,20,401,AGAGGGCTTCTATAATAATG,,
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40 7333,AA463610,,20,383,TGGTACCACCAGGAGGTGGG,,
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7337,AA463610,,20,359,TGGTTCAGTAAGGGAGGAGG,,
45 7338,AA463610,,20,353,AGTAAGGGAGGAGGAAGGTT,,
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50 7343,AA463610,,20,323,TTACTCATCTTTCAAAATT,,
7344,AA463610,,20,317,ATCTTTCAAAATTCACTAG,,
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7346,AA463610,,20,305,TTCACTAGGTTACTGCCAGT,,
7347,AA463610,,20,299,AGGTTACTGCCAGTCAGCCA,,
55 7348,AA463610,,20,293,CTGCCAGTCAGCCAAACAAA,,
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60 7353,AA463610,,20,263,GAAGTGTGTCCTCCTAAA,,
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65 7358,AA463610,,20,233,AATTCCTCCTTTTCCTTCC,,
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7362,AA463610,,20,209,GCACAGGATGGGCTTCTAGC,,
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7366,AA463610,,20,185,GGGATTTTACATGTTATATT,,
7367,AA463610,,20,179,TTACATGTTATATTCTGAGT,,
75 7368,AA463610,,20,173,GTATATTCTGAGTTTAAAA,,

7369,AA463610,,20,167,TTCTGAGTTTTAAACAAAAT,,
7370,AA463610,,20,161,GTTTTAAACAAAATTTTGTG,,
7371,AA463610,,20,155,AACAAAATTTTGTGCCTTAG,,
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10 7378,AA463610,,20,113,GACTTAAATGGACATATAGG,,
7379,AA463610,,20,107,AATGGACATATAGGAGGTAT,,
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7382,AA463610,,20,89,ATACTCTAAGCTCAGTTATT,,
15 7383,AA463610,,20,83,TAAGCTCAGTTATTCAAGCA,,
7384,AA463610,,20,77,CAGTTATTCAAGCATGTTTT,,
7385,AA463610,,20,71,TTCAAGCATGTTTTGATCAT,,
7386,AA463610,,20,65,CATGTTTTGATCATTAGAGC,,
7387,AA463610,,20,59,TTGATCATTAGAGCAAGATG,,
20 7388,AA463610,,20,53,ATTAGAGCAAGATGGGGTGT,,
7389,AA463610,,20,47,GCAAGATGGGGTGTGGAAGG,,
7390,AA463610,,20,41,TGGGGTGTGGAAGGGGCAGC,,
7391,AA463610,,20,35,GTGGAAGGGGCAGCCGTGGT,,
7392,AA463610,,20,29,GGGGCAGCCGTGCTCTAAA,,
25 7393,AA463610,,20,23,GCCGTGGTCTAAAAGGAACC,,
7394,AA463610,,20,17,GTCTAAAAGGAACCAACAAC,,
7395,AA463610,,20,11,AAGGAACCAACAACAATTT,,
7396,AA463610,,20,5,CCAACAACAATTTTACCTA,,
(GENBANK ACCESSION NO. R78585)
30 TTCTGGGTGTGCATCTGTTGAAATGCTCAAGACTTAATTATTGCGCTTTTGAAATCACTGTAAATGCCCCATCCGGTTCCTCTTCTTC
CCAGGTGTGCCAAGGAATTAATCTTGGTTTCACTACAATTAATTTCACTCCTTTCCAATCATGTCAATTGAAAGTGCCTTTAACGAA
AGAAATGTGCTACGTAATGGGAATTTCTTTAAGAAACCCCTGAGATTAAGAAAAAGACTATTTGGATAACTTATAGGAAAGCCTAGGAA
CCTCCAGTAGAGTGGGGATTTTTTCTTCTTCCCTTTCTCTTTTGGACAATAGTTAAATTAGGCAGTATTAGTTATGAGTTTGGTTGC
AGTGTCTTATCTTGTGGGGCTGATTTCCAAAAACCATGGTGCTGGAATTTACCAAGGGTCCCTCATACCTCACANGGCAAAACC
35 ACTTACTACCAGGGCTTTTTCTGT
(SEQ ID NO: 7397)

7398,R78585,,20,443,ACAGAAAAAGCCCTGGTAGT,,
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40 7400,R78585,,20,431,CTGGTAGTAAGTGGTTTGGC,,
7401,R78585,,20,425,GTAAGTGGTTTGGCNTGTGA,,
7402,R78585,,20,419,GGTTTGGCNTGTGAGGTATG,,
7403,R78585,,20,413,CCNTGTGAGGTATGAGGGAC,,
7404,R78585,,20,407,GAGGTATGAGGGACCCCTGG,,
45 7405,R78585,,20,401,TGAGGGACCCCTGGTAAATT,,
7406,R78585,,20,395,ACCCCTGGTAAATTCCAGCA,,
7407,R78585,,20,389,GGTAAATCCAGCAGCCATG,,
7408,R78585,,20,383,TTCCAGCAGCCATGTGGTTT,,
7409,R78585,,20,377,CAGCCATGTGGTTTTTGGAA,,
50 7410,R78585,,20,371,TGTGGTTTTTGGAAATCAGC,,
7411,R78585,,20,365,TTTTGGAATCAGCCCCACA,,
7412,R78585,,20,359,AAATCAGCCCCACAAGATAA,,
7413,R78585,,20,353,GCCCCACAAGATAAGAACAC,,
7414,R78585,,20,347,CAAGATAAGAACAAGTCAAC,,
55 7415,R78585,,20,341,AAGAACAAGTCAACCAAACT,,
7416,R78585,,20,335,ACTGCAACCAAACTCATAAC,,
7417,R78585,,20,329,ACCAAACTCATAACTAATAC,,
7418,R78585,,20,323,CTCATAACTAATACTGCCTA,,
7419,R78585,,20,317,ACTAATACTGCCTAATTTAA,,
60 7420,R78585,,20,311,ACTGCCTAATTTAACTATTG,,
7421,R78585,,20,305,TAATTTAACTATTGTCCAAA,,
7422,R78585,,20,299,AACTATTGTCCAAAAGAGAA,,
7423,R78585,,20,293,TGTCCAAAAGAGAAAGGGAA,,
7424,R78585,,20,287,AAAGAGAAAGGGAAGAGAA,,
65 7425,R78585,,20,281,AAAGGGAAGAGAAAAAAT,,
7426,R78585,,20,275,AAGAAGAAAAAATCCCCAC,,
7427,R78585,,20,269,AAAAAATCCCCACTCTACT,,
7428,R78585,,20,263,ATCCCCACTCTACTGGGAGG,,
7429,R78585,,20,257,ACTCTACTGGGAGGTTCTTA,,
70 7430,R78585,,20,251,CTGGGAGGTTCTTAGGCTTT,,
7431,R78585,,20,245,GGTTCTTAGGCTTTCTTATA,,
7432,R78585,,20,239,TAGGCTTTCTTATAAGTTAT,,
7433,R78585,,20,233,TTCTTATAAGTTATCCAAAT,,
7434,R78585,,20,227,TAAGTTATCCAAATAGTCTT,,
75 7435,R78585,,20,221,ATCCAAATAGTCTTTTTTTA,,

7436,R78585,,20,215,ATAGTCTTTTTTAATCTCA,,
7437,R78585,,20,209,TTTTTTAATCTCAGGGTT,,
7438,R78585,,20,203,TAATCTCAGGGTTCTTAAG,,
7439,R78585,,20,197,CAGGGTTCTTAAGAGAATT,,
5 7440,R78585,,20,191,TTCTTAAGAGAATCCCATI,,
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7442,R78585,,20,179,TTCCCATTCAGTGACCATTT,,
7443,R78585,,20,173,TTCAAGTGACCATTTCTTTTCG,,
7444,R78585,,20,167,GACCATTTCTTTTCGTTAAAG,,
10 7445,R78585,,20,161,TTCTTTTCGTTAAAGGCACIT,,
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15 7450,R78585,,20,131,GATTGGAAAGGAGTGAATTT,,
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7452,R78585,,20,119,GTGAATTTAATTGTAGTGA,,
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7454,R78585,,20,107,TGTAGTGAACCAAAGATTAA,,
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7456,R78585,,20,95,AAGATTAAATTCCTTGGCACA,,
7457,R78585,,20,89,AATTCCTTGGCACACCTGGG,,
7458,R78585,,20,83,TTGGCACACCTGGGAAGAAG,,
7459,R78585,,20,77,CACCTGGGAAGAAGAGGAAC,,
25 7460,R78585,,20,71,GGAGAAGAGGAACCGGATG,,
7461,R78585,,20,65,AGAGGAACCGGATGGGGGCA,,
7462,R78585,,20,59,ACCGGATGGGGGCATTTACA,,
7463,R78585,,20,53,TGGGGGCATTTACAGTGATT,,
7464,R78585,,20,47,CATTTACAGTGATTTCAAAA,,
30 7465,R78585,,20,41,CAGTGATTTCAAAAAGGCAAA,,
7466,R78585,,20,35,TTTCAAAAAGGCAAAATAATTA,,
7467,R78585,,20,29,AAGGCAAAATAATTAAGTCTT,,
7468,R78585,,20,23,ATAATTAAGTCTTGAGCAT,,
7469,R78585,,20,17,TAAGTCTTGAGCATTTCAAC,,
35 7470,R78585,,20,11,TTGAGCATTTCAACAGATGC,,
7471,R78585,,20,5,ATTTCACAGATGCACACC,,
(GENBANK ACCESSION NO. R33851)
CATTATATGACACCTTGACACTCTTACCGTCTTGACAGAAGCCAAGTAAGGAACTGAAGTTGTATCTGACTGTAGGGTGAATGTCTGA
GGCCTGCCTCCTAATAAAGACTCAAGGAGGAAGTCAATTGGGCATCTGCTAATAGAAATGAACCTCATGATGGGAAACTTCAGTTCAT
40 TTACTTTGTCTGGAAAAATCCCGGGTTCTGTTCCATTTTGAGGCGAAATTTGGGCGTGGGGGAAAAACCACGTTCTTTCCCTTTCCGA
TTTCTTTTCATCCGCTCTTACGGNTATGGCAATTCCTCCCCAANTATAGGATCTTTATTTCTGGGTCATTTTCCCTA
(SEQ ID NO: 7472)

7473,R33851,,20,320,TAGGGGAAAAATGAGCCAGAA,,
45 7474,R33851,,20,314,AAAATGAGCCAGAAATAAAG,,
7475,R33851,,20,308,AGCCAGAAATAAAGATCCTA,,
7476,R33851,,20,302,AAATAAAGATCCTATANTTG,,
7477,R33851,,20,296,AGATCCTATANTTGGGGGAG,,
7478,R33851,,20,290,TATANTTGGGGGAGGAATTG,,
50 7479,R33851,,20,284,TGGGGGAGGAATTGCCATAN,,
7480,R33851,,20,278,AGGAATTGCCATANCCGTAA,,
7481,R33851,,20,272,TGCCATANCCGTAAGACCGG,,
7482,R33851,,20,266,ANCCGTAAGACCGGATGAAA,,
7483,R33851,,20,260,AAGACCGGATGAAAGAAATC,,
55 7484,R33851,,20,254,GGATGAAAGAAATCGGAAAG,,
7485,R33851,,20,248,AAGAAATCGGAAAGGAAAGA,,
7486,R33851,,20,242,TCGGAAAGGAAAGAACGTGG,,
7487,R33851,,20,236,AGGAAAGAACGTGGTTTTTC,,
7488,R33851,,20,230,GAACGTGGTTTTTCCCCCAA,,
60 7489,R33851,,20,224,GGTTTTTCCCCCAAGGCCAA,,
7490,R33851,,20,218,TCCCCCAAGGCCCAATTTTCG,,
7491,R33851,,20,212,AAGGCCCAATTTTCGCTCAA,,
7492,R33851,,20,206,CAATTTTCGCTCAAAATGGA,,
7493,R33851,,20,200,CGCCTCAAAATGGAACAGAA,,
65 7494,R33851,,20,194,AAAATGGAACAGAACCCGGG,,
7495,R33851,,20,188,GAACAGAACCCGGGAATTTT,,
7496,R33851,,20,182,AACCCGGGAATTTCCAGGA,,
7497,R33851,,20,176,GGAATTTCCAGGACAAAGT,,
7498,R33851,,20,170,TTCCAGGACAAAGTAAATGA,,
70 7499,R33851,,20,164,GACAAAGTAAATGAACTGAA,,
7500,R33851,,20,158,GTAATGAACTGAAAGTTTCC,,
7501,R33851,,20,152,GAAGTGAAGTTTCCATCAT,,
7502,R33851,,20,146,AAGTTTCCATCATGAGTTC,,
7503,R33851,,20,140,CCCATCATGAGTTCATTCTA,,
75 7504,R33851,,20,134,ATGAGTTCATTCTATTAGCA,,

7505,R33851,,20,128,TCATTCTATTAGCAGATGCC,,
7506,R33851,,20,122,TATTAGCAGATGCCCAATTG,,
7507,R33851,,20,116,CAGATGCCCAATTGACTTCC,,
7508,R33851,,20,110,CCCAATTGACTTCCTCCTTG,,
5 7509,R33851,,20,104,TGACTTCCTCCTTGAGTCTT,,
7510,R33851,,20,98,CCTCCTTGAGTCTTATTAG,,
7511,R33851,,20,92,TGAGTCTTATTAGGAGGCA,,
7512,R33851,,20,86,TTTATTAGGAGGCAGGCCTC,,
7513,R33851,,20,80,AGGAGGCAGGCCTCAGACAT,,
10 7514,R33851,,20,74,CAGGCCTCAGACATTCACCC,,
7515,R33851,,20,68,TCAGACATTCACCCCTACAGT,,
7516,R33851,,20,62,ATTCACCCCTACAGTCAGATA,,
7517,R33851,,20,56,CCTACAGTCAGATACAACTT,,
7518,R33851,,20,50,GTCAAGATACAACTTCAGTTC,,
15 7519,R33851,,20,44,TACAACTTCAGTTCCTTACT,,
7520,R33851,,20,38,TTCACTTCCTTACTTGGCTT,,
7521,R33851,,20,32,TCCTTACTTGGCTTCTGTCA,,
7522,R33851,,20,26,CTTGGCTTCTGTCAAGACGG,,
7523,R33851,,20,20,TTCTGTCAAGACGGTAAGAG,,
20 7524,R33851,,20,14,CAAGACGGTAAGAGTGCAAG,,
7525,R33851,,20,8,GGTAAGAGTGCAAGGTGTCA,,
7526,R33851,,20,2,AGTGCAAGGTGTCAATAAT,,
(GENBANK ACCESSION NO. R14663)
GATTTCAGACTGCAGAGGGGAAAGACTTCCATCTAGTCACAAAGACTCCTTCGTCGCCAGTTGCCGTCTAGGATTGGGCCTCCCAT
25 ATTGCTTTGCCAAATACAGAGCCTTCAAGTGCCAAACAGAGTATGTCCGATGGTATCTGGGTAAAGGAAGGAAAGCAAAAGCAAG
GGACCTTCATGCCCTTCTGATTCCCTCCACCAAAACCCACTTCCCTTCATAAGTTTGTTTAAACACTTATCTTCTGGGTAGGAAT
GNCGGTTTAAATCCATATGCTCCAGGNTCTTTTGACTGGAAGGAAAGGAGGAGGAG
(SEQ ID NO: 7527)
7528,R14663,,20,306,CTCCTCCTCCTTCTTTT,,
7529,R14663,,20,300,CTCCTTCTTTTCTTTTCTT,,
7530,R14663,,20,294,CCTTTTCTTTTCTTCCAGTCA,,
7531,R14663,,20,288,TTTTTTTCCAGTCAAAAGAN,,
7532,R14663,,20,282,TCCAGTCAAAAGANCTGGA,,
35 7533,R14663,,20,276,CAAAAGANCCTGGAGCATAT,,
7534,R14663,,20,270,ANCCTGGAGCATATGGAATT,,
7535,R14663,,20,264,GAGCATATGGAATTAACCG,,
7536,R14663,,20,258,ATGGAATTAACCGNCATT,,
7537,R14663,,20,252,TTAAACCGNCATTCTAACC,,
40 7538,R14663,,20,246,CGNCATTCTTAACCCAGAAG,,
7539,R14663,,20,240,TCCTAACCCAGAAGATAAGT,,
7540,R14663,,20,234,CCCAGAAGATAAGTGTAA,,
7541,R14663,,20,228,AGATAAGTGTAAACAAAC,,
7542,R14663,,20,222,GTGTTAAACAAACTTATGA,,
45 7543,R14663,,20,216,AAACAAACTTATGAAGGGGA,,
7544,R14663,,20,210,ACTTATGAAGGGGAAGTGGG,,
7545,R14663,,20,204,GAAGGGGAAGTGGGGTTGG,,
7546,R14663,,20,198,GAAGTGGGGTTTGGTGGAGG,,
7547,R14663,,20,192,GGGTTTGGTGGAGGGGAATC,,
50 7548,R14663,,20,186,GGTGGAGGGGAATCAGAAAG,,
7549,R14663,,20,180,GGGGAATCAGAAAGGCATGA,,
7550,R14663,,20,174,TCAGAAGGGCATGAAGGTCC,,
7551,R14663,,20,168,GGGCATGAAGGTCCCTTGCT,,
7552,R14663,,20,162,GAAGGTCCCTTGCTTTTGCT,,
55 7553,R14663,,20,156,CCCTTGCTTTTGCTTTCCTT,,
7554,R14663,,20,150,CTTTTGCTTTTCTTCTTAC,,
7555,R14663,,20,144,CTTCTCTCTTACCCAGAT,,
7556,R14663,,20,138,TTCTTACCCAGATACCATC,,
7557,R14663,,20,132,ACCCAGATACCATCGGACAT,,
60 7558,R14663,,20,126,ATACCATCGGACATACTCTG,,
7559,R14663,,20,120,TCGGACATACTCTGTTTGGC,,
7560,R14663,,20,114,ATACTCTGTTTGGCACTTGA,,
7561,R14663,,20,108,TGTTTGGCACTTGAAGGCTC,,
7562,R14663,,20,102,GCACTTGAAGGCTCTGGTAT,,
65 7563,R14663,,20,96,GAAGGCTCTGGTATTTTGGC,,
7564,R14663,,20,90,TCTGGTATTTTGGCAAAGCA,,
7565,R14663,,20,84,ATTTTGGCAAAGCAATTATG,,
7566,R14663,,20,78,GCAAAGCAATTATGGGAGGC,,
7567,R14663,,20,72,CAATTATGGGAGGCCCAATC,,
70 7568,R14663,,20,66,TGGGAGGCCCAATCCTAGAC,,
7569,R14663,,20,60,GCCCAATCCTAGACGGCAAC,,
7570,R14663,,20,54,TCCTAGACGGCAACTGGGGA,,
7571,R14663,,20,48,ACGGCAACTGGGACGAAGG,,
7572,R14663,,20,42,ACTGGGACGAAGGAGTCTT,,
75 7573,R14663,,20,36,GACGAAGGAGTCTTTGTGAC,,

7574,R14663,,20,30,GGAGTCTTTGTGACTAGATG,,
7575,R14663,,20,24,TTTGTGACTAGATGGAAGTC,,
7576,R14663,,20,18,ACTAGATGGAAGTCTTTCCC,,
7577,R14663,,20,12,TGGAAGTCTTTCCCCTCTGC,,
5 7578,R14663,,20,6,TCTTTCCCTCTGCAGTCTG,,
(GENBANK ACCESSION NO. R33355)
TTTAAANNNTAAAGATTCTTTTATTAATAAAATTCTCCCTCCCCTCCAAACTCTCCCCAAAAATAAATATCTCCTCCCCGCTTTGGGGAGA
TTGGGGGGGTCTGTATCTTAGGGCCAGCCCTCTAGTGGGCCAGCCCCCTAGTGTTAAAAATAGGNCCCTAACCCCCAGGGGTGA
CCCCCGTGGGNGGGAATTTTCAGGGACATCTGAGTGAGTGGGGGCCCTAGTGCAAGTCTTGCCCCCAAGTCAGCCTGGGCCCCAG
10 GCTTCTTAGGGAAGGGANGGGCACCCCCNCCCTGTTGCAAAATGCTTGCAAGTTCCTTAGTCAGTGTACAGCTGTTT
(SEQ ID NO: 7579)

7580,R33355,,20,317,AAACAGCTGACACTGACTAA,,
7581,R33355,,20,311,CTGACACTGACTAAGGAACT,,
15 7582,R33355,,20,305,CTGACTAAGGAACTGCAAGC,,
7583,R33355,,20,299,AAGGAACTGCAAGCATTTC,,
7584,R33355,,20,293,CTGCAAGCATTTGCAACAGG,,
7585,R33355,,20,287,GCAATTTGCAACAGGNAGGG,,
7586,R33355,,20,281,GCAACAGGNAGGGGGGTGC,,
20 7587,R33355,,20,275,GGGNAGGGGGGTGCCNTCC,,
7588,R33355,,20,269,GGGGGTGCCNTCCCTTCCC,,
7589,R33355,,20,263,GCCCNCTCCCTTCCCTAAGAA,,
7590,R33355,,20,257,CCCTTCCCTAAGAAAGCCTGG,,
7591,R33355,,20,251,CCTAAGAAGCCTGGGGGCC,,
25 7592,R33355,,20,245,AAGCCTGGGGGCCAGGCTG,,
7593,R33355,,20,239,GGGGGCCAGGCTGACTTGG,,
7594,R33355,,20,233,CCAGGCTGACTTGGGGGGCA,,
7595,R33355,,20,227,TGACTTGGGGGGCAAGACTT,,
7596,R33355,,20,221,GGGGGGCAAGACTTGACACT,,
30 7597,R33355,,20,215,CAAGACTTGACACTAGGCC,,
7598,R33355,,20,209,TTGACACTAGGCCCCACTC,,
7599,R33355,,20,203,CTAGGCCCCCACTCACTCAG,,
7600,R33355,,20,197,CCCCACTCACTCAGATGTCC,,
7601,R33355,,20,191,TCACTCAGATGTCCCTGAAA,,
35 7602,R33355,,20,185,AGATGTCCCTGAAATTCN,,
7603,R33355,,20,179,CCCTGAAATTCNCCNCCACG,,
7604,R33355,,20,173,AATTCNCCNCCACGGGGGTC,,
7605,R33355,,20,167,CNCCACGGGGGTCACCCCT,,
7606,R33355,,20,161,CGGGGGTCACCCCTGGGGGG,,
40 7607,R33355,,20,155,TCACCCCTGGGGGGTTAGGG,,
7608,R33355,,20,149,CTGGGGGGTTAGGNCCTAT,,
7609,R33355,,20,143,GGTTAGGNCCTATTTTAA,,
7610,R33355,,20,137,GGNCCTATTTTAACTAG,,
7611,R33355,,20,131,ATTTTAACTAGGGGGCT,,
45 7612,R33355,,20,125,AACACTAGGGGGCTGGCCCA,,
7613,R33355,,20,119,AGGGGGCTGGCCCACTAGGA,,
7614,R33355,,20,113,CTGGCCCACTAGGAGGGCTG,,
7615,R33355,,20,107,CACTAGGAGGGCTGGCCCTA,,
7616,R33355,,20,101,GAGGGCTGGCCCTAAGATAC,,
50 7617,R33355,,20,95,TGGCCCTAAGATACAGACCC,,
7618,R33355,,20,89,TAAGATACAGACCCCCCAA,,
7619,R33355,,20,83,ACAGACCCCCCAATCTCCC,,
7620,R33355,,20,77,CCCCCAATCTCCCCAAAGC,,
7621,R33355,,20,71,AATCTCCCCAAAGCGGGAG,,
55 7622,R33355,,20,65,CCCAAAGCGGGGAGGAGATA,,
7623,R33355,,20,59,GCGGGGAGGAGATTTTATT,,
7624,R33355,,20,53,AGGAGATTTTATTTTGGGG,,
7625,R33355,,20,47,TATTTATTTTGGGGAGAGTT,,
7626,R33355,,20,41,TTTGGGGAGAGTTTGGAGG,,
60 7627,R33355,,20,35,GGAGAGTTTGGAGGGGAGGG,,
7628,R33355,,20,29,TTTGGAGGGGAGGGAGAATT,,
7629,R33355,,20,23,GGGAGGGGAGAATTATTAA,,
7630,R33355,,20,17,GGAGAATTATTATAAAAG,,
7631,R33355,,20,11,TTTATTATAAAAGAATCTT,,
65 7632,R33355,,20,5,AATAAAAGAATCTTANNTT,,
(GENBANK ACCESSION NO. T64626)
CTCAGGTGAGACCAGATTGTGTCTTTGGCTCCACCTTCATCTTGCAAGNCAGCTGATCTCAGATTGCCAAGAACTAGAAGCCACT
TGCACGGTGTGGCCAGAGCTCAGCTGGATGAGAGGCTGAGATGGGTGGCCAGCTTGATACCAAGTCCCTGAACTGAGCTGTTTACA
GGACTGGGGAGGCTCCACCCAGAAAGGCTTTTACTTTGTACTCTGCTGGGAAGTGAAGGGAAAACTCCTTCCCTGCTGCTGAGTGGAG
70 AGAGGCCTCATCCGGCTTTGACCCACCATCCGTTGCAGAAAGCCTCCAGGGAGCAGCAATCCTAAGAGTTGGGAGGCAGCCAAAGAC
CCCTTTCCTTTCAAAACCTTCCCGGAAGTNGTTTT
(SEQ ID NO: 7633)

7634,T64626,,20,362,AAAACNACTTCCGGGAAGGT,,
75 7635,T64626,,20,356,ACTTCCGGGAAGGTTTGAA,,

7636,T64626,,20,350,GGGAAGGTTTTGAAAGGAAA,,
7637,T64626,,20,344,GTTCGAAAGGAAAGGGGGT,,
7638,T64626,,20,338,AAAGGAAAGGGGGTCTTGGC,,
7639,T64626,,20,332,AAAGGGGGTCTTGCTGCCTC,,
5 7640,T64626,,20,326,GTCTTGGCTGCCTCCCACT,,
7641,T64626,,20,320,GCTGCCTCCCACTCTTAGG,,
7642,T64626,,20,314,TCCCACTCTTAGGATTGCT,,
7643,T64626,,20,308,CTCTTAGGATTGCTGCTCCC,,
7644,T64626,,20,302,GGATTGCTGCTCCCTGGAGG,,
10 7645,T64626,,20,296,CTGCTCCCTGGAGGCTTCTG,,
7646,T64626,,20,290,CCTGGAGGCTTCTGCAACGG,,
7647,T64626,,20,284,GGCTTCTGCAACGGATGGTG,,
7648,T64626,,20,278,IGCAACGGATGGTGGGTCAA,,
7649,T64626,,20,272,GGATGGTGGGTCAAAGCCGG,,
15 7650,T64626,,20,266,TGGGTCAAAGCCGGATGAGG,,
7651,T64626,,20,260,AAAGCCGGATGAGGCCTCTC,,
7652,T64626,,20,254,GGATGAGGCCTCTCTCCACT,,
7653,T64626,,20,248,GGCCTCTCTCCACTCAGCAG,,
7654,T64626,,20,242,TCTCCACTCAGCAGCAGGGA,,
20 7655,T64626,,20,236,CTCAGCAGCAGGGAAGGAGT,,
7656,T64626,,20,230,AGCAGGGAAGGAGTTTTTCC,,
7657,T64626,,20,224,GAAGGAGTTTTTCCCAGTCA,,
7658,T64626,,20,218,GTTCCTCCAGTCACTCCCA,,
7659,T64626,,20,212,CCCAGTCACTCCAGCAGAG,,
25 7660,T64626,,20,206,CACTCCAGCAGAGTACAAA,,
7661,T64626,,20,200,CAGCAGAGTACAAATGAAAG,,
7662,T64626,,20,194,AGTACAAATGAAAGCCTTCT,,
7663,T64626,,20,188,AATGAAAGCCTTCTGGGTGG,,
7664,T64626,,20,182,AGCCTTCTGGGTGGAGCCTC,,
30 7665,T64626,,20,176,CTGGGTGGAGCCTCCCAAGT,,
7666,T64626,,20,170,GGAGCCTCCCAAGTCTGTA,,
7667,T64626,,20,164,TCCCAAGTCTGTAAACAGC,,
7668,T64626,,20,158,GTCTGTAAACAGCTCAGTT,,
7669,T64626,,20,152,TAAACAGCTCAGTTCAGGGA,,
35 7670,T64626,,20,146,GCTCAGTTCAGGACTGGTA,,
7671,T64626,,20,140,TTCAGGACTGGTATACAAG,,
7672,T64626,,20,134,GACTGGTATACAAGCTGGCC,,
7673,T64626,,20,128,TATACAAGCTGGCCACCCAT,,
7674,T64626,,20,122,AGCTGGCCACCCATCTCAGC,,
40 7675,T64626,,20,116,CCACCATCTCAGCCTCTCA,,
7676,T64626,,20,110,ATCTCAGCCTCTCATCCAGC,,
7677,T64626,,20,104,GCCTCTCATCCAGCTGAGCT,,
7678,T64626,,20,98,CATCCAGCTGAGCTCTGGCC,,
7679,T64626,,20,92,GCTGAGCTCTGGCCACACCG,,
45 7680,T64626,,20,86,CTCTGGCCACACCGTGCAAG,,
7681,T64626,,20,80,CCACACCGTGCAAGTGGCTT,,
7682,T64626,,20,74,CGTGCAAGTGGCTTCTAGTT,,
7683,T64626,,20,68,AGTGGCTTCTAGTTTCTTGG,,
7684,T64626,,20,62,TTCTAGTTTCTTGGCAATCT,,
50 7685,T64626,,20,56,TTTCTTGGCAATCTGAGATC,,
7686,T64626,,20,50,GGCAATCTGAGATCAGCTGN,,
7687,T64626,,20,44,CTGAGATCAGCTGNTCTGCA,,
7688,T64626,,20,38,TCAGCTGNTCTGCAAGATGA,,
7689,T64626,,20,32,GNTCTGCAAGATGAAAGGTGG,,
55 7690,T64626,,20,26,CAAGATGAAAGGTGGAGCCAA,,
7691,T64626,,20,20,GAAGGTGGAGCCAAATGACA,,
7692,T64626,,20,14,GGAGCCAAATGACACAATCT,,
7693,T64626,,20,8,AAATGACACAATCTGGTCTC,,
7694,T64626,,20,2,CACAATCTGGTCTCACCTGA,,
60 (GENBANK ACCESSION NO. AA448261)
TTTCCAGAAAAGGATATTTTTTTTATTCAAGTAAGTAACTGCAAAATAGGAAACCAGAGAGGGAGCCCCAGGCTGGGACAAATCATGGCTA
CCCCCCCCAACAGAAACAGGGGGAGGAGGTGGCCCTACACCTTTATGGTCGATTTCGGGGCCCCCTTGCTCACTCTGCTGCAGCATC
CTAGGGGCAGGGCCAGCCTTCCCTGGGACTGGGGTGTGCGTACCCAGCCTGCCATGCCCCAGCCCCCTCTCCCCACAAAGAGTA
TCTTGGGGGAGGGGATCGTGGGCAGAACAGGAGGCAATGAGGATGAACATTTGGCGCTGGTAGCAGCAGCAATGACGGATTGTCTG
65 AAGAATGGAACATTGAACA
(SEQ ID NO: 7695)

7696,AA448261,,20,344,TGTTCAATGTTCCATTCTTC,,
7697,AA448261,,20,338,ATGTTCCATTCTTCGACAAT,,
70 7698,AA448261,,20,332,CATTCTTCGACAATCCGTC,,
7699,AA448261,,20,326,TCGACAATCCGTCATTGCTG,,
7700,AA448261,,20,320,ATCCGTCATTGCTGCTGCTA,,
7701,AA448261,,20,314,CATTGCTGCTGCTACCAGCG,,
7702,AA448261,,20,308,TGCTGCTACCAGCGCCAAAT,,
75 7703,AA448261,,20,302,TACCAGCGCCAAATGTTTCAT,,

7704,AA448261,,20,296,CGCCAAATGTTTCATCCTCAT,,
7705,AA448261,,20,290,ATGTTTCATCCTCATTGCCTC,,
7706,AA448261,,20,284,ATCCTCATTGCCTCCTGTTTC,,
7707,AA448261,,20,278,ATTGCCTCCTGTTCTGCCCCA,,
5 7708,AA448261,,20,272,TCCTGTTCTGCCCACGATCC,,
7709,AA448261,,20,266,TCTGCCCACGATCCCCTCCC,,
7710,AA448261,,20,260,CACGATCCCCTCCCCCAAGA,,
7711,AA448261,,20,254,CCCCTCCCCCAAGATACTCT,,
7712,AA448261,,20,248,CCCCAAGATACTCTTTGTGG,,
10 7713,AA448261,,20,242,GATACTCTTTGTGGGGAAGA,,
7714,AA448261,,20,236,CTTTGTGGGGAAGAGGGGCT,,
7715,AA448261,,20,230,GGGGAAGAGGGGCTGGGGCA,,
7716,AA448261,,20,224,GAGGGGCTGGGGCATGGCAG,,
7717,AA448261,,20,218,CTGGGGCATGGCAGGCTGGG,,
15 7718,AA448261,,20,212,CATGGCAGGCTGGGTGACCG,,
7719,AA448261,,20,206,AGGCTGGGTGACCGACTACC,,
7720,AA448261,,20,200,GGTGACCGACTACCCAGTC,,
7721,AA448261,,20,194,CGACTACCCAGTCCCAGGG,,
7722,AA448261,,20,188,CCCCAGTCCCAGGGAAGGCT,,
20 7723,AA448261,,20,182,TCCCAGGGAAGGCTGGCCCT,,
7724,AA448261,,20,176,GGAAGGCTGGCCCTGCCCT,,
7725,AA448261,,20,170,CTGGCCCTGCCCTAGGATG,,
7726,AA448261,,20,164,CTGCCCTAGGATGCTGCAG,,
7727,AA448261,,20,158,CTAGGATGCTGCAGCAGAGT,,
25 7728,AA448261,,20,152,TGCTGCAGCAGAGTGAGCAA,,
7729,AA448261,,20,146,AGCAGAGTGAGCAAGGGGGC,,
7730,AA448261,,20,140,GTGAGCAAGGGGGCCGAAT,,
7731,AA448261,,20,134,AAGGGGGCCGAATCGACCA,,
7732,AA448261,,20,128,GCCCGAATCGACCATAAAG,,
30 7733,AA448261,,20,122,ATCGACCATAAAGGGGTAG,,
7734,AA448261,,20,116,CATAAAGGGGTAGGGGCCA,,
7735,AA448261,,20,110,GGGTGTAGGGGCCACCTCCT,,
7736,AA448261,,20,104,AGGGGCCACCTCCTCCCTCT,,
7737,AA448261,,20,98,CACCTCCTCCCTGTTCTG,,
35 7738,AA448261,,20,92,CTCCCCCTGTTCTGTTGGGG,,
7739,AA448261,,20,86,CTGTTCTGTTGGGGAGGGGT,,
7740,AA448261,,20,80,TGTTGGGGAGGGGTAGCCAT,,
7741,AA448261,,20,74,GGAGGGGTAGCCATGATTG,,
7742,AA448261,,20,68,GTAGCCATGATTTGTCCAG,,
40 7743,AA448261,,20,62,ATGATTTGTCCAGCCTGGG,,
7744,AA448261,,20,56,TGTCCAGCCTGGGGCTCCC,,
7745,AA448261,,20,50,AGCCTGGGGCTCCCTCTCTG,,
7746,AA448261,,20,44,GGGCTCCCTCTCTGTTTCC,,
7747,AA448261,,20,38,CCTCTCTGTTTCTCTATTG,,
45 7748,AA448261,,20,32,TGGTTTCTATTGTCAGTTA,,
7749,AA448261,,20,26,CCTATTGTCAGTTACTTGAA,,
7750,AA448261,,20,20,TGCAGTTACTTGAATAAAAA,,
7751,AA448261,,20,14,TACTTGAATAAAAAAATAT,,
7752,AA448261,,20,8,AATAAAAAAATATCCTTTT,,
50 7753,AA448261,,20,2,AAAAATATCCTTTTCTGGAA,,
(GENBANK ACCESSION NO. R44202)
TTTTTTTTTAGATTCTTAATTTCTATTTTATATTTTAAACATGATATTAGTATATAAGATAATATAGCTAGCCAGTGTAGTAAAG
AAGTCATGATTGAGTCTTAAAAAGAAACAATCCAGTGTTGCAGTTCAGAGAGGTTAGCATGTGAGGGCGCAGGCTCGGCGAGGNTG
TGCITTTGCATTTAGGGACACAGCCCGAGCCGACGAAGGTCAGCAGGGAGCACGTCTGGGCACCTTCAGTACCAGGGCTGGGTGAG
55 AGAGCCCGGA
(SEQ ID NO: 7754)

7755,R44202,,20,252,TCCGGGCTCTCTCACCCAGC,,
7756,R44202,,20,246,CTCTCTCACCCAGCCCTGGT,,
60 7757,R44202,,20,240,CACCCAGCCCTGGTACTGAA,,
7758,R44202,,20,234,GCCCTGGTACTGAAGGTGCC,,
7759,R44202,,20,228,GTACTGAAGGTGCCAGACG,,
7760,R44202,,20,222,AAGGTGCCAGACGTGCTCC,,
7761,R44202,,20,216,CCCAGACGTGCTCCCTGCTG,,
65 7762,R44202,,20,210,CGTGCTCCCTGCTGACCTTC,,
7763,R44202,,20,204,CCCTGCTGACCTTCTGCGGC,,
7764,R44202,,20,198,TGACCTTCTGCGGCTCCGGG,,
7765,R44202,,20,192,TCTGCGGCTCCGGGCTGTGT,,
7766,R44202,,20,186,GCTCCGGGCTGTGTCCCTAA,,
70 7767,R44202,,20,180,GGCTGTGTCCCTAAATGCAA,,
7768,R44202,,20,174,GTCCCTAAATGCAAAGCACA,,
7769,R44202,,20,168,AAATGCAAAGCACANCCTCG,,
7770,R44202,,20,162,AAAGCACANCCTCGCCGAGC,,
7771,R44202,,20,156,CANCCTCGCCGAGCCTGCGC,,
75 7772,R44202,,20,150,CGCCGAGCCTGCGCCCTGAC,,

- 7773,R44202,,20,144,GCCTGCGCCCTGACATGCTA,,
7774,R44202,,20,138,GCCCTGACATGCTAACCTCT,,
7775,R44202,,20,132,ACATGCTAACCTCTCTGAAC,,
7776,R44202,,20,126,TAACCTCTCTGAACTGCAAC,,
5 7777,R44202,,20,120,CTCTGAACTGCAACACTGGA,,
7778,R44202,,20,114,ACTGCAACACTGGATTGTTT,,
7779,R44202,,20,108,ACACTGGATTGTTCTTTTT,,
7780,R44202,,20,102,GATTGTTCTTTTTAAGACT,,
7781,R44202,,20,96,TCTTTTTTAAGACTCAATCA,,
10 7782,R44202,,20,90,TTAAGACTCAATCATGACTT,,
7783,R44202,,20,84,CTCAATCATGACTTCTTTAC,,
7784,R44202,,20,78,CATGACTTCTTTACTAACAC,,
7785,R44202,,20,72,TTCTTTACTAACACTGGCTA,,
7786,R44202,,20,66,ACTAACACTGGCTAGCTATA,,
15 7787,R44202,,20,60,ACTGGCTAGCTATATTACT,,
7788,R44202,,20,54,TAGCTATATTATCTTATATA,,
7789,R44202,,20,48,TATTATCTTATATACTAATA,,
7790,R44202,,20,42,CTTATATACTAATATCATGT,,
7791,R44202,,20,36,TACTAATATCATGTTTTAAA,,
20 7792,R44202,,20,30,TATCATGTTTTAAAAATATA,,
7793,R44202,,20,24,GTTTTAAAAATATAAAATAG,,
7794,R44202,,20,18,AAAAATATAAAATAGAAATTA,,
7795,R44202,,20,12,TAAAAATAGAAATTAAGAATC,,
7796,R44202,,20,6,AGAAATTAAGAATCTAAAAA,,
25 (GENBANK ACCESSION NO. W81570)
GCGACCGCTCGCGCCTCTCGANGGACAACCTCGCACTTGCTCAACAAGGGCCTGCCGCTGGGGTCNGACCTCNGATCATGAACGGGC
ACCTGCANCCCGCGGCCCTGGTGCCATTGNTGGATGGCCGGGACTGCACAGTGGAGATGCCCATCCTGAAGGACGTGGCCACTGTG
GCTTCTGCGACGCGCAGTCCACGAGGAGATCCATGAGAAGGTCCTGAACGAGGCTGTGGGGGCCCTGATGTACCACACCATCACT
CTCACCGAGGAGGACCTGGAGAAAGTTCAAAGCCCTCCGCATCATCGTCCGGATTGGCAGTGGTTTTGACAACATCGACATCAAGTC
30 GGCCGGGGATTTTAGGCATTTCGCCGTTCTGCAACGTGCCCGCGCGTCTGTTGGGAGGAGACGGCCGACTTCGA
(SEQ ID NO: 7797)

7798,W81570,,20,400,TCGAAGTCGGCCGCTCCTC,,
7799,W81570,,20,394,TCGGCCGTTCTCCTCCCAACA,,
35 7800,W81570,,20,388,GTCTCCTCCCAACAGAACGC,,
7801,W81570,,20,382,TCCCAACAGAACGCCGCGGG,,
7802,W81570,,20,376,CAGAACGCCGCGGGCACGTT,,
7803,W81570,,20,370,GCCGCGGGCACGTTGCAGAA,,
7804,W81570,,20,364,GGCACGTTGCAGAACGGCAA,,
40 7805,W81570,,20,358,TTGCAGAACGGCAAAATGCCT,,
7806,W81570,,20,352,AACGGCAAAATGCCTAAAAATC,,
7807,W81570,,20,346,AAATGCCTAAAAATCCCGGC,,
7808,W81570,,20,340,CTAAAAATCCCGGCCGACTT,,
7809,W81570,,20,334,TCCCGGCCGACTTGATGTC,,
45 7810,W81570,,20,328,GCCGACTTGATGTCGATGTT,,
7811,W81570,,20,322,TTGATGTCGATGTTGTCAAA,,
7812,W81570,,20,316,TCGATGTTGTCAAAACCACT,,
7813,W81570,,20,310,TTGTCAAAACCACTGCCAAT,,
7814,W81570,,20,304,AAACCACTGCCAATCCGGAC,,
50 7815,W81570,,20,298,CTGCCAATCCGGACGATGAT,,
7816,W81570,,20,292,ATCCGGACGATGATGCGGAG,,
7817,W81570,,20,286,ACGATGATGCGGAGGGCTTT,,
7818,W81570,,20,280,ATGCGGAGGGCTTTGAACCT,,
7819,W81570,,20,274,AGGGCTTTGAACCTTCCAG,,
55 7820,W81570,,20,268,TTGAACCTTCTCCAGGTCCTC,,
7821,W81570,,20,262,TTCTCCAGGTCCTCCCTGGT,,
7822,W81570,,20,256,AGGTCCTCCCTGGTGAGAGT,,
7823,W81570,,20,250,TCCCTGGTGAGAGTGATGGT,,
7824,W81570,,20,244,GTGAGAGTGATGGTGTTGTA,,
60 7825,W81570,,20,238,GTGATGGTGTTGTTACATCAG,,
7826,W81570,,20,232,GTGTGGTACATCAGGGCCCC,,
7827,W81570,,20,226,TACATCAGGGCCCCACAGC,,
7828,W81570,,20,220,AGGGCCCCACAGCCTCGTT,,
7829,W81570,,20,214,CCCACAGCCTCGTTACAGGAC,,
65 7830,W81570,,20,208,GCCTCGTTACAGACCTTCTC,,
7831,W81570,,20,202,TTACAGGACCTTCTCATGGAT,,
7832,W81570,,20,196,ACCTTCTCATGGATCTCCTG,,
7833,W81570,,20,190,TCATGGATCTCCTGCGTGGA,,
7834,W81570,,20,184,ATCTCCTGCGTGGAAGTGGC,,
70 7835,W81570,,20,178,TGCGTGGAAGTGGCGTGGCA,,
7836,W81570,,20,172,GACTGCGGTCGAGAAAGCC,,
7837,W81570,,20,166,GCGTCGAGAAAGCCACAGTG,,
7838,W81570,,20,160,CAGAAAGCCACAGTGGCCACG,,
7839,W81570,,20,154,CCACAGTGGCCACGTCCTTC,,
75 7840,W81570,,20,148,TGGCCACGTCCTTCAGGATG,,

7841,W81570,,20,142,CGTCCCTCAGGATGGGCATC,,
7842,W81570,,20,136,TCAGGATGGGCATCTCCACT,,
7843,W81570,,20,130,TGGGCATCTCCACTGTGCAG,,
7844,W81570,,20,124,TCTCCACTGTGCAGTCCCGG,,
5 7845,W81570,,20,118,CTGTGCAGTCCCGGCCATCC,,
7846,W81570,,20,112,AGTCCCGGCCATCCANCAAT,,
7847,W81570,,20,106,GGCCATCCANCAATGCCACC,,
7848,W81570,,20,100,CCANCAATGCCACCAGGGGC,,
7849,W81570,,20,94,ATGCCACCAGGGGCCCGGN,,
10 7850,W81570,,20,88,CCAGGGGCCCGGNTGCAGG,,
7851,W81570,,20,82,GCCGCGGNTGCAGGTGCCCG,,
7852,W81570,,20,76,GNTGCAGGTGCCCGTTCATG,,
7853,W81570,,20,70,GGTGGCCGTTTCATGATCNGA,,
7854,W81570,,20,64,CGTTCATGATCNGAGGTTCNG,,
15 7855,W81570,,20,58,TGATCNGAGGTTCNGACCCAA,,
7856,W81570,,20,52,GAGGTCNGACCCAAAGCGGCA,,
7857,W81570,,20,46,NGACCCAAAGCGGCAAGCCCT,,
7858,W81570,,20,40,AAGCGGCAGGCCCTTGTGTA,,
7859,W81570,,20,34,CAGGCCCTTGTGAGCAAGT,,
20 7860,W81570,,20,28,CTTGTGAGCAAGTGCAGT,,
7861,W81570,,20,22,GAGCAAGTGCAGTGTCCN,,
7862,W81570,,20,16,GTGCGAGTGTCCNTCGAGA,,
7863,W81570,,20,10,GTGTCCNTCGAGAGGCGCG,,
7864,W81570,,20,4,CNTCGAGAGGCGCGAGCGGT,,
25 (GENBANK ACCESSION NO. AA128561)
ATTAGAAAAAAACTTCTTTAATGGGAAATTTACGATTGAAATGATGTTTCATCTTATAGACCACAAACAAATGTTTTAGACAT
TGAAAGTGGTTAAAGACCAACTGCGCCCAAGTCCCAAGTGCATTTCTGAGTGCAGAAATGGAGGGTGACGCTTGTAGCTGATG
CTGTGTCCCCAGCATCAGGTTTCTGTTTCCCTCTTCCCTTTATCCCTTCCTTGTCCATTGCCCTCAACCTTCTTTTCTGTTTGTCT
CTGGCCTGGTTTCAGTATAACATATCCATGAATCTAGTATGGCCTACGGACAATCATAGCTACAATCAGACTTTCTAAGCAAATGG
30 GGAATGTGGAATNTACATATAACCATTAGAAACCCCTATCATCACCTCCTAGAGGGGAAGTGAATTTCTTAAT
(SEQ ID NO: 7865)

7866,AA128561,,20,402,ATTAAGAAATTCACCTTCCCC,,
7867,AA128561,,20,396,AAATTCACCTTCCCTCTAGG,,
35 7868,AA128561,,20,390,ACTTCCCTCTAGGAGGTGA,,
7869,AA128561,,20,384,CCTCTAGGAGGTGATGATAG,,
7870,AA128561,,20,378,GGAGGTGATGATAGGTTTC,,
7871,AA128561,,20,372,GATGATAGGTTTCTAATGG,,
7872,AA128561,,20,366,AGGTTTCTAATGGTTATAT,,
40 7873,AA128561,,20,360,TCTAATGGTTATATGTANAT,,
7874,AA128561,,20,354,GGTTATATGTANATCCACAT,,
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7877,AA128561,,20,336,ATCCCCATTTGCTTAGAAA,,
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50 7883,AA128561,,20,300,GATTGTCCGTAGGCCCATAC,,
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7886,AA128561,,20,282,ACTAGAGTTCATGGATATGT,,
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55 7888,AA128561,,20,270,GGATATGTTATACTGAACCA,,
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65 7898,AA128561,,20,210,AAGGAAGGAATAAAGGGAGA,,
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75 7908,AA128561,,20,150,AGCTCAAGACGTCAACCTCC,,

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7917,AA128561,,20,96,GGCGCAGTTGGTCTTTAAACC,,
10 7918,AA128561,,20,90,GTGGTCTTTAAACCACCTTT,,
7919,AA128561,,20,84,CTTTAAACCACTTTTCAATGT,,
7920,AA128561,,20,78,CCACTTTTCAATGTCTAAAA,,
7921,AA128561,,20,72,TTCAATGTCTAAAAACATTT,,
7922,AA128561,,20,66,GTCTAAAAACATTTGTTTGT,,
15 7923,AA128561,,20,60,AAACATTTGTTTGTGGTCTA,,
7924,AA128561,,20,54,TTGTTTGTGGTCTATAAGAT,,
7925,AA128561,,20,48,GTGGTCTATAAGATGAAACA,,
7926,AA128561,,20,42,TATAAGATGAAACATCAATT,,
7927,AA128561,,20,36,ATGAAACATCAATTCAATCG,,
20 7928,AA128561,,20,30,CATCAATTCAATCGTAAAAAT,,
7929,AA128561,,20,24,TTCAATCGTAAAAATTTCCCA,,
7930,AA128561,,20,18,CGTAAAAATTTCCCATTAAG,,
7931,AA128561,,20,12,ATTTCCCATTAAGAAGTTT,,
7932,AA128561,,20,6,CATTAAAGAAGTTTTTTTTT,,
25 (GENBANK ACCESSION NO. N58473)
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ACTTTAGTTTCTCTGTTCTCTGAATAACTGCCATCTATTTCTAAGCAACAGGAAAAAGAAATCTATATGAAACTTCTCGAAAAAGTACTT
TCTGGCCAGGCGTGGTTGTTCACACCTGTAATTTTCAGCATGTTGGGAGGCTGAGGCAGGTGGATTACTTGAGGCCAGGAGTTCAAGA
30 CCAGCCTGGCCAACATGGCGAAACCCCGTCTCTACTAAACATACAAAAAATCAGTTGGGCATGGTGGCGTGTGCTGTAGTCCAGC
TACTTGGGAGGCTGAGGCACAAGAATTGCTTCAACCCAGGGGACAGAAAAGAAAAAGTACATTCTTTGGACATAGCTTCATTGCAGA
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35 7934,N58473,,20,572,TCGGCACGNGACCAACATGC,,
7935,N58473,,20,566,CGNGACCAACATGCCTAGTA,,
7936,N58473,,20,560,CAACATGCCTAGTATTTTAG,,
7937,N58473,,20,554,GCCTAGTATTTTAGTTAGAG,,
7938,N58473,,20,548,TATTTTAGTTAGAGATGAAT,,
40 7939,N58473,,20,542,AGTTAGAGATGAATTGCTTT,,
7940,N58473,,20,536,AGATGAATTGCTTTGATGNG,,
7941,N58473,,20,530,ATTGCTTTGATGNGATTTTT,,
7942,N58473,,20,524,TTGATGNGATTTTTTTCTT,,
7943,N58473,,20,518,NGATTTTTTTTCTTTTCTG,,
45 7944,N58473,,20,512,TTTTTCTTTTCTGCAATGA,,
7945,N58473,,20,506,TTTTTCTGCAATGAAGCTAT,,
7946,N58473,,20,500,TGCAATGAAGCTATGTCCAA,,
7947,N58473,,20,494,GAAGCTATGTCCAAAGAAATG,,
7948,N58473,,20,488,ATGTCCAAAGAAATGTACTTT,,
50 7949,N58473,,20,482,AAAGAAATGTACTTTTCTTT,,
7950,N58473,,20,476,TGTACTTTTCTTTTCTGTCC,,
7951,N58473,,20,470,TTTCTTTTCTGTCCCCTGGG,,
7952,N58473,,20,464,TTCTGTCCCCTGGGTTGAAG,,
7953,N58473,,20,458,CCCCTGGGTTGAAGCAATTC,,
55 7954,N58473,,20,452,GGTTGAAGCAATTCCTGTGC,,
7955,N58473,,20,446,AGCAATTCCTGTGCCTCAGC,,
7956,N58473,,20,440,TCTTGTGCCTCAGCCTCCCA,,
7957,N58473,,20,434,GCCTCAGCCTCCCAAGTAGC,,
7958,N58473,,20,428,GCCTCCCAAGTAGCTGGGAC,,
60 7959,N58473,,20,422,CAAGTAGCTGGGACTACAGC,,
7960,N58473,,20,416,GCTGGGACTACAGCACACGC,,
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7962,N58473,,20,404,GCACACGCCACCATGCCCAA,,
7963,N58473,,20,398,GCCACCATGCCCAACTGATT,,
65 7964,N58473,,20,392,ATGCCCAACTGATTTTTTGT,,
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7966,N58473,,20,380,TTTTTGTATGTTTATAGTAGA,,
7967,N58473,,20,374,GTATGTTTATAGTAGACGGG,,
7968,N58473,,20,368,TTAGTAGAGACGGGGTTTCQ,,
70 7969,N58473,,20,362,GAGACGGGGTTTCGCCATGT,,
7970,N58473,,20,356,GGGTTTCGCCATGTTGGCCA,,
7971,N58473,,20,350,CGCCATGTTGGCCAGGCTGG,,
7972,N58473,,20,344,GTGGCCAGGCTGGTCTTGA,,
7973,N58473,,20,338,CAGGCTGGTCTTGAACCTCT,,
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7982,N58473,,20,284,CATGCTGAAATTACAGGTGT,,
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10 7984,N58473,,20,272,ACAGGTGTGAACAACACGC,,
7985,N58473,,20,266,GTGAACAACACGCCTGGCC,,
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15 7989,N58473,,20,242,AGTACTTTTCGAGAAAGTTTC,,
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20 7994,N58473,,20,212,TTTTCCTGTTGCTTAGAAAT,,
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25 7999,N58473,,20,182,TATTCAGAGAACCAGAGAAA,,
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8002,N58473,,20,164,AACTAAAGTGTGTACATTTTC,,
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30 8004,N58473,,20,152,TACATTTCCAGTCAAAAAA,,
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35 8009,N58473,,20,122,AAAATATTGACTATGAGCAG,,
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40 8014,N58473,,20,92,TGGATTGTCTGTTAATTATC,,
8015,N58473,,20,86,GTCTGTTAATTATCCGTGTT,,
8016,N58473,,20,80,TAATTATCCGTGTTACATG,,
8017,N58473,,20,74,TCCGTGTTACATGCAGTGA,,
8018,N58473,,20,68,TTACATGCAGTGAGTAATA,,
45 8019,N58473,,20,62,TGCAGTGAGTAATAATTGGC,,
8020,N58473,,20,56,GAGTAATAATTGGCACATTT,,
8021,N58473,,20,50,TATTTGGCACATTTTCTCT,,
8022,N58473,,20,44,GCACATTTTCTACATTC,,
8023,N58473,,20,38,TTTTTCTACATTCCTTATT,,
50 8024,N58473,,20,32,CTACATTCCTTATTTCATC,,
8025,N58473,,20,26,TCCTTATTTTCATCCAGAGT,,
8026,N58473,,20,20,TTTTCATCCAGAGTATAATT,,
8027,N58473,,20,14,TCCAGAGTATAATTAATGTC,,
8028,N58473,,20,8,GTATAATTAATGTCTTAATA,,
55 8029,N58473,,20,2,TTAATGTCTTAATATACCA,,
(GENBANK ACCESSION NO. AA679352)
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60 ATTCCCAGCCTTTGTGTGGAAAAGGCAGTTTGCATTCCTAGGAAACATCTAACTGTTACCTAAACCATAAAATTTTCTATCTACTCCA
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8032,AA679352,,20,452,AGCATTTCAGTGCCACGTTTT,,
8033,AA679352,,20,446,CAGTGCCACGTTTAAAGTTA,,
8034,AA679352,,20,440,CACGTTTTAGGTTAAATCCC,,
8035,AA679352,,20,434,TTAGGTTAAATCCCTGCCAT,,
70 8036,AA679352,,20,428,TAAATCCCTGCCATATGGGA,,
8037,AA679352,,20,422,CCTGCCATATGGGACTGTCA,,
8038,AA679352,,20,416,ATATGGGACTGTCAGGAGAT,,
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75 8041,AA679352,,20,398,ATCCTACTTAGTATGATCTT,,

8042,AA679352,,20,392,CTTAGTATGATCTTGGCTAG,,
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5 8045,AA679352,,20,374,AGAATGATAATTAATAATTAT,,
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8057,AA679352,,20,302,TTCTTTCTGTTCCGGCTCCTA,,
8058,AA679352,,20,296,CTGTTCCGGCTCCTATTTTTC,,
8059,AA679352,,20,290,GGCTCCTATTTTCTCATCA,,
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20 8061,AA679352,,20,278,TCTCATCATTTTGTTTTCTT,,
8062,AA679352,,20,272,CATTTTGTTTTCTTTAATTG,,
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8064,AA679352,,20,260,TTTAATTGGGTTGAATGGAG,,
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25 8066,AA679352,,20,248,GAATGGAGTAGATAGAAAATA,,
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30 8071,AA679352,,20,218,AGGTAACAGTTAGATGTTTC,,
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8073,AA679352,,20,206,GATGTTTCTTAAGAATGCAA,,
8074,AA679352,,20,200,TCCTAAGAATGCAAACTGCC,,
8075,AA679352,,20,194,GAATGCAAACTGCCTTTCC,,
35 8076,AA679352,,20,188,AAACTGCCTTTCCACACAA,,
8077,AA679352,,20,182,CCTTTCCACACAAAGGCTG,,
8078,AA679352,,20,176,CCACACAAAGGCTGGGAATA,,
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40 8081,AA679352,,20,158,TAAATTTCTGGGTATTCTCG,,
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50 8091,AA679352,,20,98,CAGGATTGCTTTTGACCTTT,,
8092,AA679352,,20,92,TGCTTTTGACCTTTTAGAAG,,
8093,AA679352,,20,86,TGACCTTTTAGAAGATTGGT,,
8094,AA679352,,20,80,TTTAGAAGATTGGTCTCCAG,,
8095,AA679352,,20,74,AGATTGGTCTCCAGTAAAGG,,
55 8096,AA679352,,20,68,GTCTCCAGTAAAGGTGGACA,,
8097,AA679352,,20,62,AGTAAAGGTGGACATTTTGT,,
8098,AA679352,,20,56,GGTGGACATTTTGTGAGATT,,
8099,AA679352,,20,50,CATTTTGTGAGATTTTATAA,,
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60 8101,AA679352,,20,38,TTTTATAATAAAGAATTTAA,,
8102,AA679352,,20,32,AATAAAGAATTTAATTGCTC,,
8103,AA679352,,20,26,GAATTTAATTGCTCTGCATT,,
8104,AA679352,,20,20,AATTGCTCTGCATTTGTCAA,,
8105,AA679352,,20,14,TCTGCATTTGTCAAGTAAAA,,
65 8106,AA679352,,20,8,TTGTCAAGTAAAAAAAAA,,
8107,AA679352,,20,2,AAGTAAAAAAAAAAAAAAAAA,,
(GENBANK ACCESSION NO. N55459)
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70 TTGCNAACACAGCCCTGGGCACACTTGCTACAGCCCACGGGCANGCAGGAGCAGCAGCTCTTCTTGCANGAGGGTG
(SEQ ID NO: 8108)

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8110,N55459,,20,225,CNTGCAAGAAGAGCTGCTGC,,
75 8111,N55459,,20,219,AGAAGAGCTGCTGCTCCTGC,,

773

8179,AA150500,,20,311,GACAGGCTGTTGTGGCGTGA,,
8180,AA150500,,20,305,CTGTTGTGGCGTGAGGCCAA,,
8181,AA150500,,20,299,TGGCGTGAGGCCAAGCTGGA,,
8182,AA150500,,20,293,GAGGCCAAGCTGGACCACTG,,
5 8183,AA150500,,20,287,AAGCTGGACCACTGCAGGCG,,
8184,AA150500,,20,281,GACCACTGCAGGCGTGTCT,,
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8186,AA150500,,20,269,CGTGTCTCTGCGGGTGCTG,,
8187,AA150500,,20,263,CTCTGCGGGTGCTGAGTGAG,,
10 8188,AA150500,,20,257,GGGTGCTGAGTGAGCGCCTC,,
8189,AA150500,,20,251,TGAGTGAGCGCCTCCTGCAC,,
8190,AA150500,,20,245,AGCGCCTCCTGCACAAGAGC,,
8191,AA150500,,20,239,TCCTGACAAGAGCATCCAG,,
8192,AA150500,,20,233,ACAAGAGCATCCAGAACAGC,,
15 8193,AA150500,,20,227,GCATCCAGAACAGCCTGCTT,,
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8195,AA150500,,20,215,GCCTGCTTGGACACAGCTCG,,
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8197,AA150500,,20,203,ACAGCTCGGTGGAAGATGCG,,
20 8198,AA150500,,20,197,CGGTGGAAGATGCGAGGGCA,,
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8202,AA150500,,20,173,TGGAGCTCTATCAAATCTCC,,
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30 8208,AA150500,,20,137,GNCGAGGGCTGCCCGCCTG,,
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8211,AA150500,,20,119,TGGCTGTGTGACTGAAGC,,
8212,AA150500,,20,113,TGTGACTGAAGCCCCATC,,
35 8213,AA150500,,20,107,ACTGAAGCCCCATCCAGCCC,,
8214,AA150500,,20,101,GCCCCATCCAGCCGTTCCG,,
8215,AA150500,,20,95,TCCAGCCGTTCCGCAGGGA,,
8216,AA150500,,20,89,CCGTTCCGCAGGGACTAGAG,,
8217,AA150500,,20,83,CGCAGGGACTAGAGGCTTTC,,
40 8218,AA150500,,20,77,GACTAGAGGCTTTCGGCTTT,,
8219,AA150500,,20,71,AGGCTTTCGGCTTTTGGGA,,
8220,AA150500,,20,65,TCGGCTTTTGGGACAGCAA,,
8221,AA150500,,20,59,TTTTGGGACAGCAACTACCT,,
8222,AA150500,,20,53,GACAGCAACTACCTTGCTTT,,
45 8223,AA150500,,20,47,AACTACCTTGCTTTTGGAAA,,
8224,AA150500,,20,41,CTTGCTTTTGGAAAAATACAT,,
8225,AA150500,,20,35,TTTGGAAAAATACATTTTAA,,
8226,AA150500,,20,29,AAATACATTTTAAATAGTAA,,
8227,AA150500,,20,23,ATTTTAAATAGTAAAGTGGC,,
50 8228,AA150500,,20,17,AATAGTAAAGTGGCTCTATA,,
8229,AA150500,,20,11,AAAGTGGCTCTATATTTCT,,
8230,AA150500,,20,5,GCTCTATATTTCTCTACGC,,
(GENBANK ACCESSION NO. H16833)
TTTTTTTTAGGGGGCTATAGAAGGGATTGTGACATTTATTGTTCTGAAAATGCCATCAAAGACAGTTGTAAAGNCTAGTCTCATAC
55 ACACCTTGCAAGACATAGCCAAAAGAGGTAAATTTGAAATTAGAAAAATATCAGCAGTTATTACCCAGAGCTTGAAATCTGACC
TGTTACACAGTAGGATATTCAACCTCCATTTACAGCGTATTTAGGTACTTATTAGGTAGATTGCAAAATTACTAGAAAAAAATTCCT
AGAGGACATCTTGAAATGTAAAGTAGCAGGAAANTTACAAAGTTATAACTTNATTTACAAGNTCCCTA
(SEQ ID NO: 8231)
60 8232,H16833,,20,311,TAGGGANCTTGTAATNAAG,,
8233,H16833,,20,305,NCTTGTAATNAAGTTATAA,,
8234,H16833,,20,299,AAATNAAGTTATAACTTTGT,,
8235,H16833,,20,293,AGTTATAACTTTGTAANTTT,,
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65 8237,H16833,,20,281,GTAANTTTCTGCTACTTTA,,
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8239,H16833,,20,269,CTACTTTATCATTTTCAAGA,,
8240,H16833,,20,263,TATCATTTTCAAGATGTCCT,,
8241,H16833,,20,257,TTTCAAGATGTCCTCTAGGA,,
70 8242,H16833,,20,251,GATGTCCTCTAGGAATTTT,,
8243,H16833,,20,245,CTCTAGGAATTTTCTTCTA,,
8244,H16833,,20,239,GAATTTTCTTCTAGTAATT,,
8245,H16833,,20,233,TTTTCTAGTAATTTTGCAA,,
8246,H16833,,20,227,TAGTAATTTTGCAATCTACC,,
75 8247,H16833,,20,221,TTTGCAATCTACCTAATAA,,

8248,H16833,,20,215,AATCTACCTAATAAGTACCT,,
8249,H16833,,20,209,CCTAATAAGTACCTAAATAC,,
8250,H16833,,20,203,AAGTACCTAAATACGCTGAA,,
8251,H16833,,20,197,CTAAATACGCTGAAATGGAG,,
5 8252,H16833,,20,191,ACGCTGAAATGGAGTTGAA,,
8253,H16833,,20,185,AAATGGAGGTTGAATATCCT,,
8254,H16833,,20,179,AGGTTGAATATCCTACTGTG,,
8255,H16833,,20,173,AATATCCTACTGTGTAAACAG,,
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10 8257,H16833,,20,161,TGTAACAGGTCAGAAATTTCA,,
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15 8262,H16833,,20,131,AATAACTGCTGATATTTTTT,,
8263,H16833,,20,125,TGCTGATATTTTTCTAAAT,,
8264,H16833,,20,119,TATTTTTCTAATTTCAAAT,,
8265,H16833,,20,113,TTCTAATTTCAAATTTACCT,,
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20 8267,H16833,,20,101,ATTTACCTCTTTTGGCTATG,,
8268,H16833,,20,95,CTCTTTTGGCTATGTCTTGC,,
8269,H16833,,20,89,TGGCTATGTCTTGCCAAGTG,,
8270,H16833,,20,83,TGTCTTGCCAAGTGTGTATG,,
8271,H16833,,20,77,GCCAAGTGTGTATGAGACTA,,
25 8272,H16833,,20,71,TGTGTATGAGACTAGNCTTT,,
8273,H16833,,20,65,TGAGACTAGNCTTTACAACT,,
8274,H16833,,20,59,TAGNCTTTACAACTGTCTTT,,
8275,H16833,,20,53,TTACAACTGTCTTTGATGGC,,
8276,H16833,,20,47,CTGTCTTTGATGGCATTITC,,
30 8277,H16833,,20,41,TTGATGGCATTITTCAGAACA,,
8278,H16833,,20,35,GCATTTTCAGAACAATAAAT,,
8279,H16833,,20,29,TCAGAACAATAAATGTCACA,,
8280,H16833,,20,23,CAATAAATGTCACAAATCCCT,,
8281,H16833,,20,17,ATGTCACAAATCCCTTCTATA,,
35 8282,H16833,,20,11,CAATCCCTTCTATAGCCCCC,,
8283,H16833,,20,5,CTTCTATAGCCCCCTAAAAA,,
(GENBANK ACCESSION NO. AA644211)
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40 ATACACAACCCAAATTTCCAGGTTTTGTGTCAGCAGATCAATGTTAATAACAAATCAAGTTTTTTTTTAAAAAAACAGTGAACAGTG
TTTTATACAAGCATATTGACTATTTCTTTCTTAACCTTAAACATTTCTAAACGTAAAAATTTGTAAGAAAGATTCTCCTGAGTTATCTTTA
ATGATATTTATTTTCTTTCTCCCTCTTCCCAAAAGAAAAATTTTTTTCAATTATTTATATAAAATACTATTATCTGTAATCAGCGTTTGA
TTTAAAAATATTAAAAACCCACAGTGCTTGA
(SEQ ID NO: 8284)

45 8285,AA644211,,20,362,TCAAGCACTGTGGGTTTTAA,,
8286,AA644211,,20,356,ACTGTGGGTTTTAATTTTT,,
8287,AA644211,,20,350,GGTTTTAATTTTTTAAATC,,
8288,AA644211,,20,344,AATATTTTTTAAATCAAACGC,,
8289,AA644211,,20,338,TTTAAATCAAACGCTGATTA,,
50 8290,AA644211,,20,332,TCAAACGCTGATTACAGATA,,
8291,AA644211,,20,326,GCTGATTACAGATAATAGTA,,
8292,AA644211,,20,320,TACAGATAATAGTATTTATA,,
8293,AA644211,,20,314,TAATAGTATTTATATAAATA,,
8294,AA644211,,20,308,TATTTATATAAATAATTGAA,,
55 8295,AA644211,,20,302,TATAAATAATTGAAAAAAT,,
8296,AA644211,,20,296,TAATTGAAAAAATTTTCTT,,
8297,AA644211,,20,290,AAAAAATTTTCTTTTGGGA,,
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8299,AA644211,,20,278,TTTTGGGAAGAGGGAGAAAA,,
60 8300,AA644211,,20,272,GAAGAGGGAGAAAAATGAAAT,,
8301,AA644211,,20,266,GGAGAAAAATGAAATAAATAT,,
8302,AA644211,,20,260,AATGAAATAAATATCATTA,,
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65 8305,AA644211,,20,242,AAAGATAAATCAGGAGAATC,,
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8309,AA644211,,20,218,TTACAATTTTACGTTTAGAA,,
70 8310,AA644211,,20,212,TTTACGTTTAGAATGTTTA,,
8311,AA644211,,20,206,GTTTAGAATGTTTAAGGTTA,,
8312,AA644211,,20,200,AATGTTTAAGGTTAAGAAAG,,
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75 8315,AA644211,,20,182,AGAAATAGTCAATATGCTTG,,

8316,AA644211,,20,176,AGTCAATATGCTTGTATAAA,,
 8317,AA644211,,20,170,TATGCTTGTATAAAACACTG,,
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 8319,AA644211,,20,158,AAACACTGTTCACTGTTTTT,,
 5 8320,AA644211,,20,152,TGTTCACTGTTTTTTTAA,,
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 8322,AA644211,,20,140,TTTTTAAAAAATACTGA,,
 8323,AA644211,,20,134,AAAAAATACTTGATTGTT,,
 8324,AA644211,,20,128,AAACTTGATTGTTATTAAC,,
 10 8325,AA644211,,20,122,GATTTGTTATTAACATTGAT,,
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 8327,AA644211,,20,110,ACATTGATCTGCTGACAAA,,
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 8329,AA644211,,20,98,TGACAAAACCTGGGAATTTG,,
 15 8330,AA644211,,20,92,AACTGGGAATTTGGGTTGT,,
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 8333,AA644211,,20,74,GTGTATGCGAATGTTTCAGT,,
 8334,AA644211,,20,68,GCGAATGTTTCAGTGCCCTCA,,
 20 8335,AA644211,,20,62,GTTCAGTGCCCTCAGACAAA,,
 8336,AA644211,,20,56,GTGCCTCAGACAAATGTGTA,,
 8337,AA644211,,20,50,CAGACAAATGTGTAITTAAC,,
 8338,AA644211,,20,44,AATGTGTATTTAACTTATGT,,
 8339,AA644211,,20,38,TATTTAACTTATGTAAAAAG,,
 25 8340,AA644211,,20,32,ACTTATGTAAAAGATAAGTC,,
 8341,AA644211,,20,26,GTAAGATAAGTCTGGAAA,,
 8342,AA644211,,20,20,GATAAGTCTGGAAATAAATG,,
 8343,AA644211,,20,14,TCTGGAAATAAATGTCTGTT,,
 8344,AA644211,,20,8,AATAAATGTCTGTTTATTTT,,
 30 8345,AA644211,,20,2,TGTCTGTTTATTTTGTACT,,
 (GENBANK ACCESSION NO. AA001432)
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 AAATATATTTAAATTTTTTAACAAGTGGAAGAAATGTTTCTTAAAGACATTTAAATTTTTAGTGGAATTAATATTACCAAAAAACA
 TTCTGTGCATAACAATTTGAATAACAATTTTTTATCTTCAAGAAATGGGATTTTATATAAAATACACATGTAGCACTGAATGCCAA
 35 AGTGATGGGTATCCATGGTCAGAAATCAAAATAGATTCCGTATTAACCTGTCTGGTTTGTGTCCTGAGTGAAGAATGATCTCGAG
 CCGGGGAGGGAGGTGCATTGGGTAATCAGTGCTTTGAAGGTGAATTTCTTGTCTGTGAAATAGGCTTGGGTTACNGGGTCAGGAC
 AACCATTCAGACTGACAGGCCCTGGACTTCCAAGGCTTCAGTGACAGGGACAGGGATGTGATTGNCATGAATATTCCTCAGACAG
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 (SEQ ID NO: 8346)
 40 8347,AA001432,,20,563,TGAGGTGCTCCNGCCANTTG,,
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 8350,AA001432,,20,545,TGACGACACTGNGGATCCCT,,
 45 8351,AA001432,,20,539,CACTGNGGATCCCTGTGNGG,,
 8352,AA001432,,20,533,GGATCCCTGTGNGGAAATCA,,
 8353,AA001432,,20,527,CTGTGNGGAAATCATTCTTT,,
 8354,AA001432,,20,521,GGAAATCATTCTTTGGCTGT,,
 8355,AA001432,,20,515,CATTCTTTGGCTGTCTGAGG,,
 50 8356,AA001432,,20,509,TTGGCTGTCTGAGGAATATT,,
 8357,AA001432,,20,503,GTCTGAGGAATATTCATGNC,,
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 8359,AA001432,,20,491,TTTCATGNCAATCACATCCCT,,
 8360,AA001432,,20,485,NCAATCACATCCCTGTCCCT,,
 55 8361,AA001432,,20,479,ACATCCCTGTCCCTGTCACT,,
 8362,AA001432,,20,473,CTGTCCCTGTCACTGAAGCC,,
 8363,AA001432,,20,467,CTGTCACTGAAGCCTTGGA,,
 8364,AA001432,,20,461,CTGAAGCCTTGGAAGTCCAG,,
 8365,AA001432,,20,455,CCTTGGAAGTCCAGGGGCT,,
 60 8366,AA001432,,20,449,AAGTCCAGGGGCTGTCACT,,
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 8370,AA001432,,20,425,ATGGTTGTCTGACCCNGTA,,
 65 8371,AA001432,,20,419,GTCTGACCCNGTAACCCAA,,
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 70 8376,AA001432,,20,389,CAGCAAGGAAATTCACCTTC,,
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 75 8381,AA001432,,20,359,ATTACCCAATGCACCTCCCT,,

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5 8385,AA001432,,20,335,GGCTCGAGATCAATCTTCAC,,
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8387,AA001432,,20,323,TTCTTCACTCAGGACACAAA,,
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8393,AA001432,,20,287,GCGAATCTAATTTTGAATTC,,
8394,AA001432,,20,281,CTAATTTTGAATTCTGACCA,,
8395,AA001432,,20,275,TTGAATTCTGACCATGGATA,,
15 8396,AA001432,,20,269,TCTGACCATGGATACCCATC,,
8397,AA001432,,20,263,CATGGATACCCATCACTTTG,,
8398,AA001432,,20,257,TACCCATCACTTTGGCATTG,,
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8400,AA001432,,20,245,TGGCATTCACTGCTACATGT,,
20 8401,AA001432,,20,239,TCAGTGCTACATGTGTATT,,
8402,AA001432,,20,233,CTACATGTGTATTATATA,,
8403,AA001432,,20,227,GTGTATTTATATAAAAAATC,,
8404,AA001432,,20,221,TTTATATAAAAAATCCCATTT,,
8405,AA001432,,20,215,TAAAAATCCCATTTCTTGAA,,
25 8406,AA001432,,20,209,TCCCATTTCTTGAAGATAAA,,
8407,AA001432,,20,203,TTCTTGAAGATAAAAAAATT,,
8408,AA001432,,20,197,AAGATAAAAAAATTGTTATT,,
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8410,AA001432,,20,185,TTGTTATTCAAATGTTATG,,
30 8411,AA001432,,20,179,TTCAAATGTTATGCACAGA,,
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40 8421,AA001432,,20,119,TCTTTTAAAGAAACATTCTTT,,
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8423,AA001432,,20,107,CATCTTTTCCACTGTTAA,,
8424,AA001432,,20,101,TTTCCACTGTTAAAAAAT,,
8425,AA001432,,20,95,CTTGTTAAAAAATTAAATA,,
45 8426,AA001432,,20,89,AAAAAATTAAATATATTTT,,
8427,AA001432,,20,83,ATTAAATATATTTTAAAGCA,,
8428,AA001432,,20,77,TATATTTTAAAGCACTTTAA,,
8429,AA001432,,20,71,TTAAAGCACTTTAAGAATAT,,
8430,AA001432,,20,65,CACCTTAAAGAAATGAAACT,,
50 8431,AA001432,,20,59,AAGAAATGAAACTTTTCATA,,
8432,AA001432,,20,53,ATGAACTTTTCATATATGTT,,
8433,AA001432,,20,47,CTTTCATATATGTTAAAGGA,,
8434,AA001432,,20,41,TATATGTTAAAGGATTATAA,,
8435,AA001432,,20,35,TTAAAGGATTATAATTATG,,
55 8436,AA001432,,20,29,GATTATAATTATGGAATTA,,
8437,AA001432,,20,23,AATTTATGGAATTAAAAAAT,,
8438,AA001432,,20,17,TGGAATTAAAAAATGCAGTG,,
8439,AA001432,,20,11,TAAAAAATGCAGTGATGCC,,
8440,AA001432,,20,5,ATGCAGTGATGTCCTTAAAA,,
60 (GENBANK ACCESSION NO. H87536)
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AAAGNGGNTAAAGACCACTGCGCCCGTCCGCCAAGNGCCATTTCTGNGTGACAGATGNGGGNGACGCTCTTGAGCTGATGCTG
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65 (SEQ ID NO: 8441)
8442,H87536,,20,318,AGCCCTGATTGTANCTATGA,,
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70 8445,H87536,,20,300,GATTGCCGTAGNCCCCATN,,
8446,H87536,,20,294,CCGTAGNCCCCATNCTAGAG,,
8447,H87536,,20,288,NCCCCATNCTAGAGTTCATG,,
8448,H87536,,20,282,TNCTAGAGTTCATGGATNTG,,
8449,H87536,,20,276,AGTTCATGGATNTGTTATAC,,
75 8450,H87536,,20,270,TGGATNTGTTATACTGACCC,,
777

8451,H87536,,20,264,TGTTATACTGACCCCAGGCC,,
8452,H87536,,20,258,ACTGACCCCAGGCCAGAGCA,,
8453,H87536,,20,252,CCCAGGCCAGAGCAAACAGA,,
8454,H87536,,20,246,CCAGAGCAAACAGAAAAAGA,,
5 8455,H87536,,20,240,CAAAACAGAAAAAGAGGTTG,,
8456,H87536,,20,234,GAAAAAGAGGTTGAGGGCA,,
8457,H87536,,20,228,GAAGGTTGAGGGCAATGGAC,,
8458,H87536,,20,222,TGAGGGCAATGGACAAGGAA,,
8459,H87536,,20,216,CAATGGACAAGGAAGGAATA,,
10 8460,H87536,,20,210,ACAAGGAAGGAATAAAGGGA,,
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8462,H87536,,20,198,TAAAGGGAGAGAGGGGAAAA,,
8463,H87536,,20,192,GAGAAGAGGGAAAAACAGAAA,,
8464,H87536,,20,186,AGGGAAAAACAGAAAACCCCTG,,
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8467,H87536,,20,168,TGATGCTGGGGACACAGCAT,,
8468,H87536,,20,162,TGGGGACACAGCATCAGCTC,,
8469,H87536,,20,156,CACAGCATCAGCTCAAGACG,,
20 8470,H87536,,20,150,ATCAGCTCAAGACGTCNCCC,,
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8472,H87536,,20,138,CGTCNCCCNCCATTCTGCAC,,
8473,H87536,,20,132,CCNCCATTCTGCACNCAGAA,,
8474,H87536,,20,126,TTCTGCACNCAGAAAATGGC,,
25 8475,H87536,,20,120,ACNCAGAAAATGGCNCCTTGG,,
8476,H87536,,20,114,AAAAATGGCNCCTGGGGGACT,,
8477,H87536,,20,108,GCNCTTGGGGGACTGGGCGC,,
8478,H87536,,20,102,GGGGGACTGGGCGCAGTTGG,,
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30 8480,H87536,,20,90,GCAGTTGGTCTTTANCCNCT,,
8481,H87536,,20,84,GGTCTTTANCCNCTTTTCAA,,
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8483,H87536,,20,72,CTTTTCAATGTCNAAAAACA,,
8484,H87536,,20,66,AATGTCNAAAAACATTTGTT,,
35 8485,H87536,,20,60,NAAAAACATTTGTTTGTGGN,,
8486,H87536,,20,54,CATTTGTTTGTGGNCNATAA,,
8487,H87536,,20,48,TTTGTGGNCNATAAGATGAA,,
8488,H87536,,20,42,GNCNATAAGATGAAACATCA,,
8489,H87536,,20,36,AAGATGAAACATCATTTCAA,,
40 8490,H87536,,20,30,AAACATCATTTCAANCGTAA,,
8491,H87536,,20,24,CATTTCAANCGTAAAAATTC,,
8492,H87536,,20,18,AANCGTAAAAATTTCCCATTA,,
8493,H87536,,20,12,AAAAATTTCCCATTAAGAAG,,
8494,H87536,,20,6,TCCCATTAAGAAGTTTIT,,
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CACCAGATTAAAGTCTCGCCATCTTCCAGCAGGCGGGTGGTGGGATCTCAGCCTCCAGCTTGACCTTGATGTTTCAGCAGGG
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50 CCATCTGTAGGGCGTACGGGCTCCACCTCCCTCAGGCTGTTCTCCAAGCTGGCCTTCAGATTTCTCATGGAGTCCAGGTCGATCTCC
AGGACTGGACTGTACGTCTCAGCTCTGTGAGCGTCGTCTCAGCAGCTCAACCTCAGCAGACTGTGTGGTGACACTGTGGTGCTCTCC
TCATCTGCTGAGACCACTGCTGTCTAGCTCCTCTCGGGTCTTCCGGAGCAGCTCCTCATATTGGCCAGATGNCCTGCAATGATCTG
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(SEQ ID NO: 8495)
55 8496,AA664179,,20,635,GGTTGACCTGAGTGTAGATG,,
8497,AA664179,,20,629,CCTGAGTGTAGATGCCNCAA,,
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60 8500,AA664179,,20,611,AAATCNCAGACCTCGNCCA,,
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8503,AA664179,,20,593,CAGATCATTGCAGNCACTGT,,
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65 8505,AA664179,,20,581,GNCATCTGGGCCAATATGAC,,
8506,AA664179,,20,575,TGGGCCAATATGACGAGCTG,,
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70 8510,AA664179,,20,551,GGAAGACCCGAGAGGAGCTA,,
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75 8515,AA664179,,20,521,GGTCTCAGCAGATGAGGAGA,,

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8519,AA664179,,20,497,CACAGTGTACCACACAGTC,,
5 8520,AA664179,,20,491,GTACCACACAGTCTGCTGA,,
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8537,AA664179,,20,389,GAAGGCCAGCTTGGAGAAC,,
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25 8540,AA664179,,20,371,CAGCCTGAGGGAGGTGGAGG,,
8541,AA664179,,20,365,GAGGGAGGTGGAGGCCCCGA,,
8542,AA664179,,20,359,GGTGGAGGCCCCGTACGCCCT,,
8543,AA664179,,20,353,GGCCCGTACGCCCTACAGAT,,
8544,AA664179,,20,347,TACGCCCTACAGATGGAGCA,,
30 8545,AA664179,,20,341,CTACAGATGGAGCAGCTCAA,,
8546,AA664179,,20,335,ATGGAGCAGCTCAACGGGAT,,
8547,AA664179,,20,329,CAGCTCAACGGGATCCTGCT,,
8548,AA664179,,20,323,AACGGGATCCTGCTGCACCT,,
8549,AA664179,,20,317,ATCCTGCTGCACCTTGAGTC,,
35 8550,AA664179,,20,311,CTGCACCTTGAGTCAGAGCT,,
8551,AA664179,,20,305,CTTGAGTCAGAGCTGGCACA,,
8552,AA664179,,20,299,TCAGAGCTGGCACAGACCCG,,
8553,AA664179,,20,293,CTGGCACAGACCCGGGACAG,,
8554,AA664179,,20,287,CAGACCCGGGACAGGGGACA,,
40 8555,AA664179,,20,281,CGGGCAGAGGGACAGCGCCA,,
8556,AA664179,,20,275,GAGGGACAGCGCCAGGCCA,,
8557,AA664179,,20,269,CAGCGCCAGGCCAGGAGTA,,
8558,AA664179,,20,263,CAGGCCAGGAGTATGAGGC,,
8559,AA664179,,20,257,CAGGAGTATGAGGCCCTGCT,,
45 8560,AA664179,,20,251,TATGAGGCCCTGCTGAACAT,,
8561,AA664179,,20,245,GCCCTGCTGAACATCAAGGT,,
8562,AA664179,,20,239,CTGAACATCAAGGTCAAGCT,,
8563,AA664179,,20,233,ATCAAGGTCAAGCTGGAGGC,,
8564,AA664179,,20,227,GTCAAGCTGGAGGCTGAGAT,,
50 8565,AA664179,,20,221,CTGGAGGCTGAGATCGCCAC,,
8566,AA664179,,20,215,GCTGAGATCGCCACCTACCG,,
8567,AA664179,,20,209,ATCGCCACCTACCGCCGCT,,
8568,AA664179,,20,203,ACCTACCGCCGCTGCTGGA,,
8569,AA664179,,20,197,CGCCGCTGCTGGAAGATGG,,
55 8570,AA664179,,20,191,CTGCTGGAAGATGGCGAGGA,,
8571,AA664179,,20,185,GAAGATGGCGAGGACTTTAA,,
8572,AA664179,,20,179,GGCGAGGACTTTAATCTTGG,,
8573,AA664179,,20,173,GACTTTAATCTTGGTGATGC,,
8574,AA664179,,20,167,AATCTTGGTGATGCCTTGA,,
60 8575,AA664179,,20,161,GGTGATGCCTTGGACAGCAG,,
8576,AA664179,,20,155,GCCTTGGACAGCAGCAACTC,,
8577,AA664179,,20,149,GACAGCAGCAACTCCATGCA,,
8578,AA664179,,20,143,AGCAACTCCATGCAAAACCAT,,
8579,AA664179,,20,137,TCCATGCAAAACCATCAAAA,,
65 8580,AA664179,,20,131,CAAACCATCAAAAAGACCAC,,
8581,AA664179,,20,125,ATCAAAAAGACCAACACCCG,,
8582,AA664179,,20,119,AAGACCACCAACCGCCGGAT,,
8583,AA664179,,20,113,ACCACCGCCGGATAGTGGA,,
8584,AA664179,,20,107,CGCCGGATAGTGATGGCAA,,
70 8585,AA664179,,20,101,ATAGTGGATGGCAAAGTGGT,,
8586,AA664179,,20,95,GATGGCAAAGTGGTGTCTGA,,
8587,AA664179,,20,89,AAAGTGGTGTCTGAGACCAA,,
8588,AA664179,,20,83,GTGTCTGAGACCAATGACAC,,
8589,AA664179,,20,77,GAGACCAATGACACCAAAGT,,
75 8590,AA664179,,20,71,AATGACACCAAAGTTCTGAG,,

8591,AA664179,,20,65,ACCAAAGTTCTGAGGCATTA,,
8592,AA664179,,20,59,GTCTGAGGCATTAAGCCAG,,
8593,AA664179,,20,53,AGGCATTAAGCCAGCAGAAG,,
8594,AA664179,,20,47,TAAGCCAGCAGAAGCAGGGT,,
5 8595,AA664179,,20,41,AGCAGAAGCAGGGTACCCCT,,
8596,AA664179,,20,35,AGCAGGGTACCCCTTGGGGA,,
8597,AA664179,,20,29,GTACCCCTTGGGGAGCAGGA,,
8598,AA664179,,20,23,TTTGGGGAGCAGGAGGCCAA,,
8599,AA664179,,20,17,GAGCAGGAGGCCAATAAAAA,,
10 8600,AA664179,,20,11,GAGGCCAATAAAAAAGTTCAG,,
8601,AA664179,,20,5,AATAAAAAAGTTCAGAGTTCA,,
(GENBANK ACCESSION NO. H86812)
ACGGCTTGGGCTGGTACCTCAGCCAGATGCCCTTCTCCTGGCCACACCAAGCTCAGAGTGAGAAGACCCCCGCGTATTTCACGTGCGC
CCAAAGTGCCCTGAGCGAGTCTACAGCATGAACCCGTCCATCCGGCTGCTGCTCATCCTGCGAGACCCGTGCGAGCGCGTGCTATCTG
15 ACTACACCCAAGTGTCTACAACCATGCAAGCACAAGCCCTACCCGTCCATCGAGGAGTTCCCTGGGTGCGNGATGGCAGGCT
CAATGTGGACTACAAGGCCCTCAACCCGAGCCTNTTACCACGTGCAACATGCAGAACTG
(SEQ ID NO: 8602)

8603,H86812,,20,300,CAGTTCTGCATGTTGCACGT,,
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20 8605,H86812,,20,288,TTGCACGTGGTAANAGGCTG,,
8606,H86812,,20,282,GTGGTAANAGGCTGCGGTTG,,
8607,H86812,,20,276,ANAGGCTGCGGTTGAGGGCC,,
8608,H86812,,20,270,TGCGGTTGAGGGCCTTGTAAG,,
25 8609,H86812,,20,264,TGAGGGCCTTGTAAGTCCACA,,
8610,H86812,,20,258,CCTTGTAAGTCCACATTGAGC,,
8611,H86812,,20,252,AGTCCACATTGAGCCTGCCA,,
8612,H86812,,20,246,CATTGAGCCTGCCATCNCGC,,
8613,H86812,,20,240,GCCTGCCATCNCGCACCCAG,,
30 8614,H86812,,20,234,CATCNCGCACCCAGGAACTC,,
8615,H86812,,20,228,GCACCCAGGAACTCCTCGAT,,
8616,H86812,,20,222,AGGAACTCCTCGATGGACGG,,
8617,H86812,,20,216,TCCTCGATGGACGGGTAGGG,,
8618,H86812,,20,210,ATGGACGGGTAGGGCTTGTG,,
35 8619,H86812,,20,204,GGGTAGGGCTTGTGCTTCTG,,
8620,H86812,,20,198,GGCTTGTGCTTCTGCATGTG,,
8621,H86812,,20,192,TGCTTCTGCATGTGGTTGTA,,
8622,H86812,,20,186,TGCATGTGGTTGTAGAACAC,,
8623,H86812,,20,180,TGGTTGTAGAACACTTGGGT,,
40 8624,H86812,,20,174,TAGAACACTTGGGTGTAGTC,,
8625,H86812,,20,168,ACTTGGGTGTAGTCAGATAG,,
8626,H86812,,20,162,GTGTAGTCAGATAGCAGCG,,
8627,H86812,,20,156,TCAGATAGCAGCGCTCCGA,,
8628,H86812,,20,150,AGCAGCGCTCCGACGGGTC,,
45 8629,H86812,,20,144,CGCTCCGACGGGTCTCGCAG,,
8630,H86812,,20,138,GACGGGTCTCGCAGGATGAG,,
8631,H86812,,20,132,TCTCGCAGGATGAGCAGCAG,,
8632,H86812,,20,126,AGGATGAGCAGCAGCCGGAT,,
8633,H86812,,20,120,AGCAGCAGCCGGATGGACGG,,
50 8634,H86812,,20,114,AGCCGGATGGACGGGTTTCAT,,
8635,H86812,,20,108,ATGGACGGGTTTCATGCTGTA,,
8636,H86812,,20,102,GGGTTTCATGCTGTAGACTCG,,
8637,H86812,,20,96,ATGCTGTAGACTCGCTCAGG,,
8638,H86812,,20,90,TAGACTCGCTCAGGCACTTT,,
55 8639,H86812,,20,84,CGCTCAGGCACTTTGGGCGA,,
8640,H86812,,20,78,GGCACTTTGGGCGACGTGAA,,
8641,H86812,,20,72,TTGGGCGACGTGAAATACGC,,
8642,H86812,,20,66,GACGTGAAATACGCGGGGGT,,
8643,H86812,,20,60,AAATACGCGGGGGTCTTCTC,,
60 8644,H86812,,20,54,GCGGGGGTCTTCTCCACTGT,,
8645,H86812,,20,48,GTCTTCTCCACTGTGAGCTG,,
8646,H86812,,20,42,TCCACTGTGAGCTGGTGTGG,,
8647,H86812,,20,36,GTGAGCTGGTGTGGCCAGGA,,
8648,H86812,,20,30,TGGTGTGGCCAGGAGAAAGG,,
65 8649,H86812,,20,24,GGCCAGGAGAAAGGCATCTG,,
8650,H86812,,20,18,GAGAAAGGCATCTGGCTGAG,,
8651,H86812,,20,12,GGCATCTGGCTGAGGTACCA,,
8652,H86812,,20,6,TGGCTGAGGTACCAAGCCCA,,
(GENBANK ACCESSION NO. AA626698)

70 TTTTTTTGGTTTTATACAGAACCTTTAATTGCAAACTTGGAAAGCAGCCATCCCGGGGTGGCAGGGGAGAACCCACCACACCTT
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CTCGGGGCTCAGAGAACTCTCCCTCTCCATGCCTTCGCCACGTACCAAGTGCACAAAGGCCCGCTTGGCATAACATGAGATCGAA
CTTATGGTCCAGGCGGGCCAGGCCTCCGCAATGGCCGTGGTGTGTGCTCAGCATGCACACGGCCCGCTGCACCTTGGCCAGGTTCC
CCCGGGGACCACTGTGGGGGGTGGTAGTTAATGCCACCTTAAATCCAGTCGGGCACCAATCCACAACTGGATAGTGGCTTGG
75 TCTGTAGTGGTGGCGATGGCGGTTGACGCTTTGGGGACCACTCCCGCTGGTACAACATGCAGCAGGCCATGTACTTGGCGTGGCG

AGGGTACACATTGACCATCTGATTGGCTGGCTCGAAGCAGGCATTGGTGTATCTCGGCCAAAGAAAGCTGCTCGTGGTAAGCCTTCTA
AGCTGAGATGATTGGGGCGTAAGTGTGCCATGGGGAAATTGGATTCCGGGGTAACGGAAACGAAGGTTGGGTCCGGAAATTC
(SEQ ID NO: 8653)

5 8654,AA626698,,20,671,GAATTTCCGGACCCAACCTT,,
8655,AA626698,,20,665,CCGGACCCAACCTTCGTTCC,,
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8657,AA626698,,20,653,TTCTGTTCCGTTACCCCGGAA,,
8658,AA626698,,20,647,CCGTTACCCCGGAATCCAAT,,
10 8659,AA626698,,20,641,CCCCGGAATCCAATTTCCCC,,
8660,AA626698,,20,635,AATCCAATTTCCCCATGGCA,,
8661,AA626698,,20,629,ATTTCCCCATGGCACACTTA,,
8662,AA626698,,20,623,CCATGGCACACTTACGCCCC,,
8663,AA626698,,20,617,CACACTTACGCCCAATCAT,,
15 8664,AA626698,,20,611,TACGCCCAATCATCTCAGC,,
8665,AA626698,,20,605,CCAATCATCTCAGCTTAGAA,,
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8667,AA626698,,20,593,GCTTAGAAGGCTTACCAAGA,,
8668,AA626698,,20,587,AAGGCTTACCACGAGCAGCT,,
20 8669,AA626698,,20,581,TACCACGAGCAGCTTTCTTT,,
8670,AA626698,,20,575,GAGCAGCTTTCTTTGGCCGA,,
8671,AA626698,,20,569,CTTTCTTTGGCCGAGATCAC,,
8672,AA626698,,20,563,TTGGCCGAGATCACCAATGC,,
8673,AA626698,,20,557,GAGATCACCAATGCCTGCTT,,
25 8674,AA626698,,20,551,ACCAATGCCTGCTTCGAGCC,,
8675,AA626698,,20,545,GCCTGCTTCGAGCCAGCCAA,,
8676,AA626698,,20,539,TTGAGCCAGCCAATCAGAT,,
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30 8679,AA626698,,20,521,ATGGTCAAGTGTGACCCTCG,,
8680,AA626698,,20,515,AAGTGTGACCCTCGCCACGG,,
8681,AA626698,,20,509,GACCCCTCGCCACGGCAAGTA,,
8682,AA626698,,20,503,CGCCACGGCAAGTACATGGC,,
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35 8684,AA626698,,20,491,TACATGGCCTGCTGCATGTT,,
8685,AA626698,,20,485,GCCTGCTGCATGTTGTACCA,,
8686,AA626698,,20,479,TGCATGTTGTACCAGGGGA,,
8687,AA626698,,20,473,TTGTACCAGGGGACGTGGT,,
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40 8689,AA626698,,20,461,GACGTGGTCCCCAAAGACGT,,
8690,AA626698,,20,455,GTCCCCAAAGACGTCAACGC,,
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45 8694,AA626698,,20,431,TCGCCACCATCAAGACCAAG,,
8695,AA626698,,20,425,CCATCAAGACCAAGCGCACT,,
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50 8699,AA626698,,20,401,AGTTTGTGGATTGGTCCCCG,,
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8701,AA626698,,20,389,GOTGCCCCGACTGGATTTAAG,,
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8703,AA626698,,20,377,GATTTAAGGTGGGCATTAAAC,,
55 8704,AA626698,,20,371,AGGTGGGCATTAACTACCAG,,
8705,AA626698,,20,365,GCATTAACCTACCAGCCCCC,,
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60 8709,AA626698,,20,341,TGGTCCCCGGGGGAGACCTG,,
8710,AA626698,,20,335,CCGGGGGAGACCTGGCCAAAG,,
8711,AA626698,,20,329,GAGACCTGGCCAAGGTGCAG,,
8712,AA626698,,20,323,TGGCCAAGGTGCAGCGGGCC,,
8713,AA626698,,20,317,AGGTGCAGCGGGCGGTGTGC,,
65 8714,AA626698,,20,311,AGCGGGCCGTGTGCATGCTG,,
8715,AA626698,,20,305,CCGTGTGCATGCTGAGCAAC,,
8716,AA626698,,20,299,GCATGCTGAGCAACACCACG,,
8717,AA626698,,20,293,TGAGCAACACCACGGCCATT,,
8718,AA626698,,20,287,ACACCACGGCCATTGCGGAG,,
70 8719,AA626698,,20,281,CGGCCATTGCGGAGGCCTGG,,
8720,AA626698,,20,275,TTGCGGAGGCCTGGGCCCGC,,
8721,AA626698,,20,269,AGGCCTGGGCCCGCCTGGAC,,
8722,AA626698,,20,263,GGGCCCGCCTGGACCATAAG,,
8723,AA626698,,20,257,GCCTGGACCATAAGTTCGAT,,
75 8724,AA626698,,20,251,ACCATAAGTTCGATCTCATG,,

8725,AA626698,,20,245,AGTTCGATCTCATGTATGCC,,
8726,AA626698,,20,239,ATCTCATGTATGCCAAGCGG,,
8727,AA626698,,20,233,TGTATGCCAAGCGGGCCTTT,,
8728,AA626698,,20,227,CCAAGCGGGCCTTTGTGCAC,,
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8730,AA626698,,20,215,TTGTGCACTGGTACGTGGGC,,
8731,AA626698,,20,209,ACTGGTACGTGGGCGAAGGC,,
8732,AA626698,,20,203,ACGTGGGCGAAGGCATGGAA,,
8733,AA626698,,20,197,GCGAAGGCATGGAAAGAGGGA,,
10 8734,AA626698,,20,191,GCATGGAAGAGGGAGAGTTC,,
8735,AA626698,,20,185,AAGAGGGAGAGTTCTCTGAG,,
8736,AA626698,,20,179,GAGAGTTCTCTGAGGCCCGC,,
8737,AA626698,,20,173,TCTCTGAGGCCCGCGAGGAC,,
8738,AA626698,,20,167,AGGCCCGCGAGGACCTGGCA,,
15 8739,AA626698,,20,161,GCGAGGACCTGGCAGCTCTA,,
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8741,AA626698,,20,149,CAGCTCTAGAGAAGGATTAT,,
8742,AA626698,,20,143,TAGAGAAGGATTATGAAGAG,,
8743,AA626698,,20,137,AGGATTATGAAGAGGTGGGC,,
20 8744,AA626698,,20,131,ATGAAGAGGTGGCGTGGAT,,
8745,AA626698,,20,125,AGGTGGGCGTGGATTCCGTG,,
8746,AA626698,,20,119,GCGTGGATTCCGTGGAAGCT,,
8747,AA626698,,20,113,ATTCGGTGGAAAGCTGAGGCT,,
8748,AA626698,,20,107,TGGAAGCTGAGGCTGAAGAA,,
25 8749,AA626698,,20,101,CTGAGGCTGAAGAAGGCGAA,,
8750,AA626698,,20,95,CTGAAGAAGGCGAAGAATAC,,
8751,AA626698,,20,89,AAGGCGAAGAATACTGAGGG,,
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8753,AA626698,,20,77,ACTGAGGGGAGGGTGTGGTG,,
30 8754,AA626698,,20,71,GGGAGGGTGTGGTGGGTTCT,,
8755,AA626698,,20,65,GTGTGGTGGGTTCTCCCTG,,
8756,AA626698,,20,59,TGGGTTCTCCCTGCCACCC,,
8757,AA626698,,20,53,CTCCCTGCCACCCCGGGA,,
8758,AA626698,,20,47,TGCCACCCCGGGATGGCTG,,
35 8759,AA626698,,20,41,CCCCGGGATGGCTGCTTCCA,,
8760,AA626698,,20,35,GATGGCTGCTTCCAAGTTGT,,
8761,AA626698,,20,29,TGCTTCCAAGTTGTTTCAA,,
8762,AA626698,,20,23,CAAGTTGTTTCAATTAAAG,,
8763,AA626698,,20,17,GTGTCAATTAAAGTTCTG,,
40 8764,AA626698,,20,11,AATTAAGGTTCTGTATAAA,,
8765,AA626698,,20,5,AGGTTCTGTATAAAACCAA,,
(GENBANK ACCESSION NO. R37953)
TTTTTTTTCCNTTTAAAGTCATCTCTATAGGAAGGTNCTGGGAGGGATCCCAGAGAAAGAAAGGGCCAAGACTCCATTAAGTCCC
45 TGGATGAAGGGACTGCTACAANAGCTAGTACCAGAGACTCTCTATCTCACGGTTGAGGCAGACCCAGGNTAGAATAGAGAATAAA
AGGAATGCTTATAGGAAACAATTTTGTATGGAATGCTAGATGGCCAAAGCTCAGCCTTTNGTCCAGTGCAACCCCTGCCTCGCTTGC
AACAGTGAATAATAGTTTNGTTAGAAGAACCATCTGGAACACACCAGCTTCTGCTACCTTCATGCTCATTGTTAAAAAAGATTA
ACCAGTGTGAACATTCTGATCTGTAAATTCAGGGGACTNTTTCTTTCCAATGGACTTTTGTGGGAG
(SEQ ID NO: 8766)
50 8767,R37953,,20,398,CTCCCAACAAAAAAGTCCAT,,
8768,R37953,,20,392,ACAAAAAAGTCCATTGGAAA,,
8769,R37953,,20,386,AAGTCCATTGGAAAGAAAAAN,,
8770,R37953,,20,380,ATTGGAAGAAAAANAGTCCC,,
8771,R37953,,20,374,AAGAAAAANAGTCCCTGAAT,,
55 8772,R37953,,20,368,ANAGTCCCTGAATTAACAG,,
8773,R37953,,20,362,CCCTGAATTAACAGATCAGA,,
8774,R37953,,20,356,ATTAACAGATCAGAATGTTT,,
8775,R37953,,20,350,AGATCAGAATGTTACACTG,,
8776,R37953,,20,344,GAATGTTACACTGGTTAAT,,
60 8777,R37953,,20,338,TCACACTGGTTAATCTTTTT,,
8778,R37953,,20,332,TGGTTAATCTTTTTTAACA,,
8779,R37953,,20,326,ATCTTTTTTTAACAATGAGC,,
8780,R37953,,20,320,TTTTAACAATGAGCATGAAG,,
8781,R37953,,20,314,CAATGAGCATGAAGGTAGCA,,
65 8782,R37953,,20,308,GCATGAAGGTAGCAGAAGCT,,
8783,R37953,,20,302,AGGTAGCAGAAGCTGGTGTG,,
8784,R37953,,20,296,CAGAAGCTGGTGTGTTTCCA,,
8785,R37953,,20,290,CTGGTGTGTTTCCAGATGGT,,
8786,R37953,,20,284,TGTTTCCAGATGGTCTTCT,,
70 8787,R37953,,20,278,CAGATGGTCTTCTAACNAA,,
8788,R37953,,20,272,GTCTCTAACNAACTAAT,,
8789,R37953,,20,266,CTAACNAACTAATTTTCA,,
8790,R37953,,20,260,AACTAATTTTCACTGTTG,,
8791,R37953,,20,254,ATTTTCACTGTTGACAAGC,,
75 8792,R37953,,20,248,CACTGTTGACAAGCGAGGCA,,

8793,R37953,,20,242,TGACAAGCGAGGCAAGGGTT,,
8794,R37953,,20,236,GCGAGGCAAGGGTTGCACTG,,
8795,R37953,,20,230,CAAGGGTTGCACTGGACNAA,,
8796,R37953,,20,224,TTGCACTGGACNAAAGGCTG,,
5 8797,R37953,,20,218,TGGACNAAAGGCTGAGCTTG,,
8798,R37953,,20,212,AAAGGCTGAGCTTGGCCATC,,
8799,R37953,,20,206,TGAGCTTGGCCATCTAGCAT,,
8800,R37953,,20,200,TGGCCATCTAGCATTCCATA,,
8801,R37953,,20,194,TCTAGCATTCCATACAAAAT,,
10 8802,R37953,,20,188,ATTCCATACAAAATTGTTTC,,
8803,R37953,,20,182,TACAAAATTGTTTCCTATAA,,
8804,R37953,,20,176,ATTGTTTCTCTATAAGCATTC,,
8805,R37953,,20,170,TCCTATAAGCATTCCCTTTA,,
8806,R37953,,20,164,AAGCATTCCCTTTTATTCTCT,,
15 8807,R37953,,20,158,TCCTTTTATTCTCTATTCTA,,
8808,R37953,,20,152,TATTCTCTATTCTANCTGG,,
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8810,R37953,,20,140,TANCTGGGTCTGCCTCAAC,,
8811,R37953,,20,134,GGGTCTGCCTCAACCGTGAG,,
20 8812,R37953,,20,128,GCCTCAACCGTGAGATAGGA,,
8813,R37953,,20,122,ACCGTGAGATAGGAGAGTCT,,
8814,R37953,,20,116,AGATAGGAGAGTCTCTGGTA,,
8815,R37953,,20,110,GAGAGTCTCTGGTACTAGCT,,
8816,R37953,,20,104,CTCTGGTACTAGCTNTTGT,,
25 8817,R37953,,20,98,TACTAGCTNTTGTAGCAGTC,,
8818,R37953,,20,92,CTNTTGTAGCAGTCCCTTCA,,
8819,R37953,,20,86,TAGCAGTCCCTTCATCCAGG,,
8820,R37953,,20,80,TCCCTTCATCCAGGGCAGTT,,
8821,R37953,,20,74,CATCCAGGGCAGTTAATGGA,,
30 8822,R37953,,20,68,GGGCAGTTAATGGAGTCTTG,,
8823,R37953,,20,62,TTAATGGAGTCTTGGCCCTT,,
8824,R37953,,20,56,GAGTCTTGGCCCTTTCTTTC,,
8825,R37953,,20,50,TGGCCCTTTCTTCTCTGGG,,
8826,R37953,,20,44,TTTCTTTCTCTGGGATCCCT,,
35 8827,R37953,,20,38,TCTCTGGGATCCCTCCAGN,,
8828,R37953,,20,32,GGATCCCTCCAGNACCTTC,,
8829,R37953,,20,26,CTCCAGNACCTTCCTATAG,,
8830,R37953,,20,20,GNACCTTCCTATAGAGATGA,,
8831,R37953,,20,14,TCCTATAGAGATGACTTTAA,,
40 8832,R37953,,20,8,AGAGATGACTTTAAANGGAA,,
8833,R37953,,20,2,GACTTTAAANGGAAAAAA,,
(GENBANK ACCESSION NO. AA069372)
GGACTCTGCAACCAAGGGAAGTGCCTGTCCAGTGTGAGAACTTTACTGCTAGGATTCCAATTGTTAATAACGCTATGTTAGCGCGC
TCGAGGAAGAAGGTAGGAATCCCGGCTCCTTTTCTCCTTCTAGTGGTTCGGGTGTTTGTTCGCTCCTCCAGGCGCGGCCCCCTCTCGA
45 CTTGCGCGCGCCATNTTCGCGCTGCGAATTCTCGGACAAACTGTCAAACGCCGNCGCGCCTTTTNGCTCTNCGGGTCCNCTA
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(SEQ ID NO: 8834)
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8837,AA069372,,20,365,AACGGTCCAAGGGAGCCTNT,,
8838,AA069372,,20,359,CCAAGGGAGCCTNTAGTGCC,,
8839,AA069372,,20,353,GAGCCTNTAGTGCTGGACA,,
55 8840,AA069372,,20,347,NTAGTGCTGGACAGNGCGG,,
8841,AA069372,,20,341,CCTGGACAGNGCGGATTCCC,,
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8843,AA069372,,20,329,GGATTCCCTTCCCCGGCAC,,
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60 8845,AA069372,,20,317,CCCGGCACCTCTTCTTCC,,
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55 8981,T74688,,20,26,GGCTTGATCTTTGGAATA,,
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(SEQ ID NO: 9057)

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(GENBANK ACCESSION NO. T59658)

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Human IL4-R

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14579 GGGCCGCCACGTGTCTCCGA
14580 GTTGCTCCGAACGGTCCGCA
14581 ACGGTCCGCAGACTGGCCAG
14582 GACTGGCCAGGACCTGGGCA
40 14583 GACCTGGGCAAGGGCGTCA
14584 AAGGGCGTCACAATCATGTC
14585 CAATCATGTCTCTCCATGT
14586 CTCTCCATGTAGGTCGCTGG
14587 AGGTCGCTGGCCACAGAGGA
45 14588 CCACAGAGGAGTTCCGAGAC
14589 GTTCCGAGACATGGCCTTGG
14590 ATGGCCTTGGGCGAGAGTTC
14591 GCGAGAGTTCATAGTCGCTA
14592 ATAGTCGCTATCTGAGCGGT
50 14593 TCTGAGCGGTACAGGAAGGA
14594 ACAGGAAGGACTCGCGCCGC
14595 CTCGCGCCGCTGGCTGTGCG
14596 TGGCTGTGCGGACTGGAGC
14597 GGA CTGGAGCCTGCATAATC
55 14598 CTGCATAATCCGGCCCAAGC
14599 CGGCCCAAGGCCAGGGCTGGA
14600 CAGGGCTGGACTGAGGGTCC
14601 CTGAGGGTCCAGGGCCCTCC
14602 AGGGCCCTCCTCCACACGA
60 14603 TCCACACGAGAGCCATTT
14604 GAGCCATTTTCCAGGTCAA
14605 TCCAGGTCAAAGCGCTGCA
14606 AGCGCCTGCAGGAGGAAACG
14607 GGAGGAAACGGGCCAGGAGA
65 14608 GGCCAGGAGAGCCGCGACTT
14609 GCCGCGACTTCTGAGCTCC
14610 CCTGAGCTCCGGCCGCGGGC
14611 GGCCGCGGGCTCAGGTCCCT
14612 TCAGGTCCCTCTCGCGCAG
70 14613 CTCGCGGCAGCCGCGGACT
14614 CCCGCGGACTTGTCCGATC
14615 TGTCCGATCCGAATAGAAG
14616 CGAATAGAAGCGCTGTTGGA
14617 CGCTGTTGGATGCGGATGGG
75 14618 TGCGGATGGGGCGCCGGGGT

14619 GCGCCGGGGTTGCCGCCACA
 14620 TGCCGCCACAGGTGCTTCGG
 14621 GGTGCTTCGGGGCTCTGGTC
 5 14622 GGCTCTGGTCATGCTGTGGC
 14623 ATGCTGTGGCGGCCGCGAGA
 14624 GGCCGCGAGAGCGACTCAAC
 14625 GCGACTCAACCTGCTGCAAG
 14626 CTGCTGCAAGCCTCTGCCCC
 14627 CCTCTGCCCTTCGCGGACC
 10 14628 TTCGCCGACCCCAAGTTCT
 14629 CCCAGGTTCTCCATGCGCCA
 14630 CCATGCGCCAGAGAAAGGCT
 14631 GAGAAAGGCTGGATGAAGGG
 14632 GGATGAAGGGTTCCGACGG
 15 14633 TTTCCGACGGGTCCTGCTT
 14634 GTCCCTGCTTGGCTGCTCCT
 14635 GGCTGCTCCTAGGCATTGCT
 14636 AGGCATTGCTGGCGGGCAAG
 14637 GGCGGCAAGGGCCGCCACG
 20 14638 GGCCGCCACGTTGCTCCGAA
 14639 TTGCTCCGAACGGTCCGACG

In one preferred embodiment, the links between neighboring mononucleotides are phosphodiester links. In another preferred, at least one mononucleotide phosphodiester residue of the anti-sense oligonucleotide(s) is substituted by a methylphosphonate, phosphotriester, phosphorothioate, phosphorodithioate, boranophosphate, formacetal, thioformacetal, thioether, carbonate, carbamate, sulfate, sulfonate, sulfamate, sulfonamide, sulfone, sulfite, sulfoxide, sulfide, hydroxylamine, 2'-O-methyl, methylene(methyimino), methyleneoxy (methylimino), phosphoramidate residues, and combinations thereof. The oligos having one or more phosphodiester residues substituted by one or more of the other residues are generally longer lasting, given that these residues are more resistant to hydrolysis than the phosphodiester residue. In some cases up to about 10%, about 30%, about 50%, about 75%, and even all phosphodiester residues may be substituted (100%).

In another preferred embodiment, the multiple target anti-sense oligo (MTA) of the invention comprises at least about 7 mononucleotides, in some instances up to 60 and more mononucleotides, preferably about 10 to about 36, and more preferably about 12 to about 21 mononucleotides. However, other lengths are also suitable depending on the length of the target macromolecule. Examples of multi-targeted anti-sense (MTA) oligos of the invention are provided in Table 3 below, which includes ninety-four sequences (SEQ ID NOS.: 2316 through 2410).

Table 3: MTA Oligos, Location Targeted & Target

MTA Oligo	SEQ. ID No.	Location	Compound Targeted	Target
HUMNFKBP65A AS				
CCC GGC CCC GCC TCG TGC C	12388	5' =1	EPI 2192	
CGT CCB TGC CGC GGG CCC	12389	5' =28 (AUG)	EPI 2193	
GCC CCG CTG CTT GGG CTG CTC TGC CCG G	12390	5' =65	EPI 2194	
TCT GTG CTC CTC TCG CCT GGG	12391	5' =137	EPI 2195	
45 TGG TGG GGT GGG TCT TGG TGG	12392	5' =159	EPI 2196	
CTG TCC CTG GTC CTG TG	12393	5' =196	EPI 2197	
GGT CCC GCT TCT TC	12394	5' =362	EPI 2198	
GGG GTT GTT GTT GGT CTG G	12395	5' =401	EPI 2199	
TGT CCT CTT TCT GC	12396	5' =656	EPI 2200	
50 GCC TCG GGC CTC CC	12397	5' =697	EPI 2201	
GGC TGG GGT CTG CGT	12398	5' =769	EPI 2202	
GGC CGG GGG TCG GTG GGT CCG CTG	12399	5' =953	EPI 2203	
GGG CTG GGG TGC TGG CTT GGG G	12400	5' =1022	EPI 2204	
GGG GCT GGG GCC TGG GCC	12401	5' =1208	EPI 2205	
55 GCC TGG GTG GGC TTG GGG GC	12402	5' =1272	EPI 2206	
GCT GGG TCT GTG CTG TTG CC	12403	5' =1362	EPI 2207	
GTT GTG TGG GGG GCC	12404	5' = 1451	EPI 2208	
GCT GGG TCG GGG GGC CTC TGG GCT GTC	12405	5' =1511	EPI 2209	
GCC CCG GGG CCC CC	12406	5' =1550	EPI 2210	
60 TGG CTC CCC CCT CC	12407	5' =1772	EPI 2211	
GCT CCC CCC TTT CC	12408	5' =1863	EPI 2212	
CGG ACG AAG ACA GAG A	12409	5' =1979	EPI 2213	
GGC TTT GTG GGC TC	12410	5' =2011	EPI 2214	
GCC TGC TCT CCC CC	12411	5' =2312	EPI 2215	
65 CCC GGC CCC GCC BCG BBC C	12412	intron	EPI 2192-01A	HSU50136C4Synth

	CCC GGC CCC GCC BCG	12413	intron	EPI 2192-01B	
	CCC GGC CCC GCC BCG BBC C	12414	5'untr	EPI 2192-02A	HUMLIPOX5LO
	CCC GGC CCC GCC BCG	12415	5'untr	EPI 2192-02B	
5	CCC GBC CCC GCC TCB BG	12416	trans	EPI 2192-03A	HSNFKBS Subunit
	CCC GBC CCC GCC TC	12417	trans	EPI 2192-03B	
	CCG GCC CCG CCT C	12418	5'untr	EPI 2192-04	TGFβR1
	CCC GBB CCC GCB TBG TGC C	12419	5'trans	EPI 2192-05A	HSU58198Il enhan
	CCC GCB TBG TGC C	12420	5'untr	EPI 2192-05B	
10	CCC GGB CCC BCC BBG TGC C	12421	3'trans	EPI 2192-06	HSVECAD
	CCG BBC CCG CCT CGT GCC	12422	intron	EPI 2192-07A	NFKB2
	C CCG CCT CGT GCC	12423	intron	EPI 2192-07B	NFKB2
	CCG GCB CCG CCT CBT GCC	12424	5'trans	EPI 2192-08	Carboxypep
	CCG GCC CCG CCB CBT GCC	12425	3'trans	EPI 2192-09	HumADRA2Cα2AdrKid
	CCC GBC CCC GBC TCG	12426	5'untrs	EPI 2192-10	HUMFKS06B
15	CCC GGC CBC GBC TCG	12427	5'untrs	EPI 2192-11	HSNBARKS1βAdrKin
	CCC GGC CCB GCC TBG	12428	5'UTR	EPI 2192-12	HSNFXN1 (NFKB1)
	CCC GGC BCB GBC TCG TBC C	12429	3'UTR	EPI 2192-13	HSILF (transcrp. Factor ILF)
20	CCC GGC CCC GCC BCG	12413		EPI-2192-14	NFKB/C4Syn/5-LO/
	CCC GGC CCC GCC BCG	12430		EPI-2192-15	TGFBrecl MTA
	TCC BTG CCG CGG GC	12432	3' trans	EPI-2193-01	NFKB/C4Syn/5-LOMTA
	TCC BTG CCB CGG GCC	12433	3' trans	EPI-2193-02	METOncoGene
	TCC BTG CCB CGG GCC	12434	mid cod	EPI-2193-03	HSFGR2 (IG)
25	TCC BTG CCB CGG GCC	12435	mid cod	EPI-2193-04	5-LO
	GTC CBT GBC GCG G	12436	3'trans	EPI-2193-05	HUMTK14
	TC CBT GBC GCG GG	12437	AUG		HUMTNER
30	TCT GBG CTC CTC TBB CCT GGG	12438	intr	EPI-2195-01	Probl.HUMPTCH
	CTG TGC BCC TBB CBC CTG GG	12439	intr	EPI-2195-02	cardiacK+channel
	TGT GBT CCB CTB GBC TGG G	12440		EPI-2195-03	humCSPAcytotox.
35	TCT GTB CTC BBC TCB CCT G	12441		EPI-2195-04	Ser. Protease
	TGC TCC TCB CBB CTG GG	12442		EPI-2195-05	HSINOSX08induc.NOS
	CTC CTC TBG CCT GG	12443		EPI-2195-06	HUMACHRM2musc.m2
40	β-Adr Rec Kinase				acetylch.rec.
	GTG CTC CBB TCB BCT GGG	12444		EPI-2195-07	s86371s1
	GTG CBC CBB TCB CCT GGG	12445		EPI-2195-08	Neurokinin3Recept
	TCT GTG CBC CTC TBG BCT	12446	exon	EPI-2195-09	HUMMIP1 Amacro
45	CTG TBB TCC TBB CBC CTG G	12482	intron	EPI-2195-10	Inflam. Factor
	TGT GCT BBT CBC BCB TGG G	12448		EPI-2195-11	HSNBARKS4
	GTG CBC CBC TCB CCT G	12449	intron/exon	EPI-2195-12	HSTNFR2S06TNF R2
	CTG TGC BCC TCT C	12450	3'UTR	EPI-2203-05	humfkbp fk506
	CBG TGC BCC BCT CBC CTG	12451	intr/ex	EPI-2203-06A	HSNBARKS1β-Adr.
50	G TGC BCC BCT CBC CTG	12449	intr/ex	EPI-2203-06B	Recept.Kinase
	CBC CTC TCB CCT GGG	12453	coding	EPI-2203-07A	HUMIL8
	C CTC TCB CCT GGG	12454	coding	EPI-2203-07B	HSU50157 PDE4
	GCT CCB CTC GCC T	12455	coding	EPI-2203-08	IL-2 R
	TGC TCC TCB CGC C	12456	intron PDGF A	EPI-2303-09	IL-6 R HSIL6R
55	GTT GTT GBT CTG G	12457	3'utr	EPI-2199-01	HSIL2rG6
	Factor for IL-5				HSIL2rG6
	GGT TGB BBT TGG TCT TGG	12458	Coding	EPI-2199-02	HUMIL71
	GGT TGT TGB TGB TCT G	12459	Far 5'UTR	EPI-2199-03	IL-7 HUMIL71
60	GGG TTB BBG TTG BTC TGG	12460	Coding	EPI-2199-04	IL-6 R HSI6REC
	GGG TBG BBG BGT CCG CTG	12461		EPI-2199-05	Chain HUMPDGFAB
	GGG TCB GBG GBT CBG CTG	12462		EPI-2199-06	GATA-4Transcrip.
65	GGG TBG GTG GGT C	12463		EPI-2199-07	TNFα HUMTNEFA
	GGG TCG GBG GGT CBG C	12464		EPI-2199-08	HSSUBPIG (Sub Pr)
	GGG TGG GCT T	12485		EPI-2206-01	NeutrophilAdh.
70	GGG TGG GCT TGG G	12468		EPI 2206-02	R HUMNARIA
					m2 Muscarinic R
					L1 LeukAadhProt
					HUMGATA2A
					IGE eps
					HSGCSFR2
					TGFβ3
					NFKB/NK & TCell
					Activating Prot
					NFKB/Prostagl.
					EP3 Rec

	CCTGGGTGGGBBTGGG	12469	EPI 2206-03	HSNF2B/GCSF NFKB/GranuLocCSF/ Transcr. FactorNF2B
5	CCTGGBTGGGCBTGGG	12470	EPI-2206-04	HUMLAP/NFKB Leuk. Adhes. Prot
	GCCTGBGTGBBCTTGGG	12471	EPI2206-05	NFKB/Endothel
	N2 S63833			
	CCCAVGCCVCCCAGGC	11769	EPI 2206-06	NFKBAS13/B Lymph SerThrProt. Kinase
10	AGCCACCCAGGC	11770	EPI2206-07	NFKBAS13/GCSF1 HSGCSFR1Rec
	BCCTGGGTGGGCTB	11771	EPI2206-08	NFKBAS13/GCSF1/ NK7TCELLACT. Prot
	GGTGGGCTTGGG	11772	EPI 2206-09	NFKBAS13/
15	HSTGFB1 TGFB			
	CCBBGGTGGGCTTGGG	11773	EPI 2206-10	NFKBAS13/ HSTGFB1 TGFB1
	CTGGGTGGGBBTGGG	11774	EPI 2206-11	NFKBAS13/
	HSGCSFR1 GCSFR1			
20	CCBGGGTGGGCTTGG	11775	EPI 2206-12	NFKBAS13/HUMCD30A LymphActAntigCoding
	GGGTGGGCTTGG	11776	EPI-2206-12B	NFKBAS13/HUMCD30A
	CCTGBGTGBGCBTGGG	11777	EPI 2206-13	NFKBAS13/HUMCAM1V Vasc. Endoth. Cell Adh. Molec
25				
	B: Universal Base			

The MTA oligos of Table 3 and others in accordance with this invention are suitable for use with two or more of the targets, such as those listed in Table 4 below.

30 Table 4: Targets for the MTA Oligos of Table 3

Compound	Target
EPI 2010	Adenosine A1 receptor
EPI 2045	Adenosine A3 receptor
EPI 2873, EPI 2193	NFκB
EPI 1873	Interleukin-1
EPI 1857	Interleukin -5
EPI 2945	Interleukin -4
EPI 2977	Interleukin -8
EPI 2031	5-Lipoxygenase
EPI 1898	Leukotriene C-4 Synthase
EPI 1856	Eotaxin
EPI 1131	ICAM
EPI 1085	VCAM
EPI 2085	TNFα
EPI 1908	PAF
EPI 1925	IL-4 receptor
EPI 2643	β2 adrenergic receptor kinase
EPI 2934	Tryptase
EPI 2033	Major Basic Protein
EPI 2795	Eosinophil Peroxidase

NfκB: nuclear factor κB
 ICAM: intracellular adhesion molecule
 VCAM: vascular cell adhesion molecule
 TNF: tumor necrosis factor
 PAF: platelet activating factor

The mRNA sequence of the targeted protein or the DNA sequence of the regulatory segment may be derived from the nucleotide sequence of the gene expressing or regulating the protein, whether for existing targets or

those to be found in the future. Sequences for many target genes of different systems are presently known. See, GenBank data base, NIH, the entire sequences of which are incorporated here by reference. The sequences of those genes, whose sequences are not yet available, may be obtained by isolating the target segments applying technology known in the art. Once the sequence of the gene, its RNA and/or the protein are known, anti-sense oligonucleotides

are produced as described above and utilized to validate the target by in vivo administration and testing for a reduction of the production of the targeted protein in accordance with standard techniques, and of specific functions. As already described above, the anti-sense oligonucleotides may be of any suitable length, e.g., from about 7 to about 60 nucleotides in length, depending on the particular target being bound and the mode of delivery thereof. The anti-sense oligonucleotide preferably is directed to an mRNA region containing a junction between intron and exon or to regions vicinal to the junction. Where the anti-sense oligonucleotide is directed to an intron/exon junction, it may either entirely overlie the junction or may be sufficiently close to the junction to inhibit splicing out of the intervening exon during processing of precursor mRNA to mature mRNA, e.g., with the 3' or 5' terminus of the anti-sense oligonucleotide being positioned within about, for example, 10, 5, 3, or 2 nucleotide of the intron/exon junction. Also preferred are anti-sense oligonucleotides which overlap the initiation codon and, more generally, those that target the coding region of the target mRNA. When practicing the present invention, the anti-sense oligonucleotide(s), administered, whether DNA or RNA may be related in origin to the species to which it is administered or to other species including prokaryotes. When treating humans, human anti-sense may be used if desired, except when targeting foreign invaders. Anti-sense oligos to endogenous sequences of other species, however, are also clearly encompassed.

Other agents that may be incorporated into the present composition are one or more of a variety of therapeutic agents which are administered to humans and animals. Some of the categories of agents suitable for incorporation into the present composition and formulations are analgesics, pre-menstrual medications, menopausal agents, anti-aging agents, anti-anxiolytic agents, mood disorder agents, anti-depressants, anti-bipolar mood agents, anti-schizophrenic agents, anti-cancer agents, alkaloids, blood pressure controlling agents, hormones, anti-inflammatory agents, muscle relaxants, soporific agents, anti-ischemic agents, anti-arrhythmic agents, contraceptives, vitamins, minerals, tranquilizers, neurotransmitter regulating agents, wound healing agents, anti-angiogenic agents, cytokines, growth factors, anti-metastatic agents, antacids, anti-histaminic agents, anti-bacterial agents, anti-viral agents, anti-gas agents, appetite suppressants, sun screens, emollients, skin temperature lowering products, radioactive phosphorescent and fluorescent contrast diagnostic and imaging agents, libido altering agents, bile acids, laxatives, anti-diarrheic agents, skin renewal agents, hair growth agents, analgesics, pre-menstrual medications, anti-menopausal agents such as hormones and the like, anti-aging agents, anti-anxiolytic agents, nociceptive agents, mood disorder agents, anti-depressants, anti-bipolar mood agents, anti-schizophrenic agents, anti-cancer agents, alkaloids, blood pressure controlling agents, hormones, anti-inflammatory agents, other agents suitable for the treatment and prophylaxis of diseases and conditions associated or accompanied with pain and inflammation, such as arthritis, burns, wounds, chronic bronchitis, chronic obstructive pulmonary disease (COPD), inflammatory bowel disease such as Crohn's disease and ulcerative colitis, autoimmune disease such as lupus erythematosus, muscle relaxants, steroids, soporific agents, anti-ischemic agents, anti-arrhythmic agents, contraceptives, vitamins, minerals, tranquilizers, neurotransmitter regulating agents, wound and burn healing agents, anti-angiogenic agents, cytokines, growth factors, anti-metastatic agents, antacids, anti-histaminic agents, anti-bacterial agents, anti-viral agents, anti-gas agents, agents for reperfusion injury, counteracting appetite suppressants, sun screens, emollients, skin temperature lowering products, radioactive phosphorescent and fluorescent contrast diagnostic and imaging agents, libido altering agents, bile acids, laxatives, anti-diarrheic agents, skin renewal agents, hair growth agents, etc.

Among the hormones suitable for active agents of the invention, are female and male sex hormones such as premarin, progesterone, androstenedione and their analogues, thyroxine and glucocorticoids, including Budesonide, Dexamethasone, Flunisolide, Triamcinolone, and others. Among the libido altering agents are Viagra and other NO-level modulating agents, among the analgesics are over-the-counter medications such as ibuprofen, oruda, aleve and acetaminophen and controlled substances such as morphine and codeine, among the anti-depressants are tricyclics, MAO inhibitors and epinephrine, γ -amino butyric acid (GABA), dopamine and serotonin level elevating agents, e.g. Prozac, Amytryptilin, Wellbutrin and Zoloft, among the skin renewal agents are Retin-A, hair growth agents such as Rogaine, among the anti-inflammatory agents are non-steroidal anti-inflammatory drugs (NSAIDs) and steroids, among the soporifics are melatonin and sleep inducing agents such as diazepam, cytoprotective, anti-ischemic and

head injury agents such as enadoline, and many others. Examples of agents in the different groups are provided in the following list. Examples of analgesics are Acetaminophen, Anilerdine, Aspirin, Buprenorphine, Butabital, Butorphanol, Choline Salicylate, Codeine, Dezocine, Diclofenac, Diflunisal, Dihydrocodeine, Elcatonin, Etodolac, Fenoprofen, Hydrocodone, Hydromorphone, Ibuprofen, Ketoprofen, Ketorolac, Levorphanol, Magnesium Salicylate, Meclofenamate, Mefenamic Acid, Meperidine, Methadone, Methotrimeprazine, Morphine, Nalbuphine, Naproxen, Opium, Oxycodone, Oxymorphone, Pentazocine, Phenobarbital, Propoxyphene, Salsalate, Sodium Salicylate, Tramadol and Narcotic analgesics in addition to those listed above. See, Mosby's Physician's GenRx. Examples of anti-anxiety agents include Alprazolam, Bromazepam, Buspirone, Chlordiazepoxide, Chlormezanone, Clorazepate, Diazepam, Halazepam, Hydroxyzine, Ketazolam, Lorazepam, Meprobamate, Oxazepam and Prazepam, among others. Examples of anti-anxiety agents associated with mental depression are Chlordiazepoxide, Amitriptyline, Loxapine Maprotiline and Perphenazine, among others. Examples of anti-inflammatory agents are non-rheumatic Aspirin, Choline Salicylate, Diclofenac, Diflunisal, Etodolac, Fenoprofen, Floctafenine, Flurbiprofen, Ibuprofen, Indomethacin, Ketoprofen, Magnesium Salicylate, Meclofenamate, Mefenamic Acid, Nabumetone, Naproxen, Oxaprozin, Phenylbutazone, Piroxicam, Salsalate, Sodium Salicylate, Sulindac, Tenoxicam, Tiaprofenic Acid, Tolmetin. Examples of anti-inflammatories for ocular treatment are Diclofenac, Flurbiprofen, Indomethacin, Ketorolac, Rimexolone (generally for post-operative treatment). Examples of anti-inflammatories for non-infectious nasal applications are Beclomethaxone, and the like. Examples of soporifics (anti-insomnia/sleep inducing agents) such as those utilized for treatment of insomnia, are Alprazolam, Bromazepam, Diazepam, Diphenhydramine, Doxylamine, Estazolam, Flurazepam, Halazepam, Ketazolam, Lorazepam, Nitrazepam, Prazepam Quazepam, Temazepam, Triazolam, Zolpidem and Sopiclone, among others. Examples of sedatives are Diphenhydramine, Hydroxyzine, Methotrimeprazine, Promethazine, Propofol, Melatonin, Trimeprazine, and the like. Examples of sedatives and agents used for treatment of petit mal and tremors, among other conditions, are Amitriptyline HCl, Chlordiazepoxide, Amobarbital, Secobarbital, Aprobital, Butabital, Ethchlorvynol, Glutethimide, L-Tryptophan, Mephobarbital, Methohexital Na, Midazolam HCl, Oxazepam, Pentobarbital Na, Phenobarbital, Secobarbital Na, Thiamylal Na, and many others. Agents used in the treatment of head trauma (Brain Injury/Ischemia) include Enadoline HCl (e.g. for treatment of severe head injury, orphan status, Warner Lambert). Examples of cytoprotective agents and agents for the treatment of menopause and menopausal symptoms are Ergotamine, Belladonna Alkaloids and Phenobarbitals. Examples of agents for the treatment of menopausal vasomotor symptoms are Clonidine, Conjugated Estrogens and Medroxyprogesterone, Estradiol, Estradiol Cypionate, Estradiol Valerate, Estrogens, conjugated Estrogens, esterified Estrone, Estropipate and Ethinyl Estradiol. Examples of agents for treatment of symptoms of Pre Menstrual Syndrome (PMS) are Progesterone, Progestin, Gonadotrophic Releasing Hormone, oral contraceptives, Danazol, Luprolide Acetate and Vitamin B6. Examples of agents for the treatment of emotional/psychiatric treatments are Tricyclic Antidepressants including Amitriptyline HCl (Elavil), Amitriptyline HCl, Perphenazine (Triavil) and Doxepin HCl (Sinequan). Examples of tranquilizers, anti-depressants and anti-anxiety agents are Diazepam (Valium), Lorazepam (Ativan), Alprazolam (Xanax), SSRI's (selective Serotonin reuptake inhibitors), Fluoxetine HCl (Prozac), Sertaline HCl (Zoloft), Paroxetine HCl (Paxil), Fluvoxamine Maleate (Luvox), Venlafaxine HCl (Effexor), Serotonin, Serotonin Agonists (Fenfluramine), and other over the counter (OTC) medications. Examples of anti-migraine agents are Imitrex and the like.

The amount of each active agent may be adjusted when, and if, additional agents with overlapping activities are included as discussed in this patent. The dosage of the active compounds, however, may vary depending on age, weight, and condition of the subject. Treatment may be initiated with a small dosage, e.g. less than the optimal dose, of the first active agent of the invention, whether an anti-inflammatory steroid or a ubiquinone, or both, and optionally other bioactive agents described above. This may be similarly done with the second active agent, until a desirable level is attained. Or vice versa, for example in the case of multivitamins and/or minerals, the subject may be stabilized at a desired level of these products and then administered the first active compound. The dose may be increased until a desired and/or optimal effect under the circumstances is reached. In general, the active agent is preferably administered at a concentration that will afford effective results without causing any unduly harmful or deleterious side effects, and may be administered either as a single unit dose, or if desired in convenient subunits administered at suitable times throughout the day. The second therapeutic or diagnostic agent(s) is (are) administered in amounts which are known in the art to be effective for the intended application. In cases where the second agent has an overlapping activity with the principal agent, the dose of one of the other or of both agents may

be adjusted to attain a desirable effect without exceeding a dose range which avoids untoward side effects. Thus, for example, when other analgesic and anti-inflammatory agents are added to the composition, they may be added in amounts known in the art for their intended application or in doses somewhat lower than when administered by themselves.

5 Pharmaceutical compositions and kits comprising an anti-sense oligo and/or the non-corticoid steroid and/or ubiquinone including doses effective to reduce expression of target protein(s) by binding specifically with DNA or mRNA either encoding, or regulating the expression of the target proteins in the cell so as to prevent its translation are also part of the present invention. Such compositions are provided in a suitable pharmaceutically or veterinarily acceptable carrier(s), e.g., sterile pyrogen-free saline solution either separately or in combination when
10 intended for dual administration, e.g. in a kit where both first and second agent are administered on specified dates whereas only one is administered other days. The active agents may be formulated with a hydrophobic carrier capable of passing through a cell membrane, e.g., in a liposome, with the liposomes carried in a pharmaceutically acceptable aqueous carrier. The oligonucleotides may also be coupled to a substance which inactivates mRNA, such as a ribozyme. Such oligonucleotides may be administered to a subject to inhibit the activation of a target, such as
15 the adenosine receptors, which subject is in need of such treatment for any of the reasons discussed herein. Furthermore, the pharmaceutical formulation may also contain chimeric molecules comprising anti-sense oligonucleotides attached to molecules which are known to be internalized by cells. These oligonucleotide conjugates utilize cellular uptake pathways to increase cellular concentrations of oligonucleotides. Examples of macromolecules used in this manner include transferrin, asialoglycoprotein (bound to oligonucleotides via
20 polylysine) and streptavidin. In the pharmaceutical formulation, the anti-sense compound may be contained within a lipid particle or vesicle, such as a liposome or microcrystal. The particles may be of any suitable structure, such as unilamellar or plurilamellar, so long as the anti-sense oligonucleotide is contained therein. Positively charged lipids such as N- [1-(2, 3 -dioleoyloxy) propyl] -N, N, N-trimethylammoniummethylsulfate, or "DOTAP," are particularly preferred for such particles and vesicles. The preparation of such lipid particles is well known. See, e.g., U.S. Patent
25 Nos. 4,880,635 to Janoff et al.; 4,906,477 to Kurono et al.; 4,911,928 to Wallach; 4,917,951 to Wallach; 4,920,016 to Allen et al.; 4,921,757 to Wheatley et al.; etc.

The active compounds provided in this patent are preferably administered to the subject as a pharmaceutical or veterinary composition. Pharmaceutical compositions for use in the present invention include formulations suitable for systemic and topical administration, including by inhalation, intrapulmonary infusion,
30 nasal, respirable, oral, topical (including buccal, sublingual, dermal and intraocular), parenteral (including subcutaneous, intradermal, intramuscular, intravenous and intraarticular), rectal, vaginal, ophthalmic, otical, implantable, and transdermal and iontophoretic administration, among others. The compositions may conveniently be provided in bulk, or presented in unit or multiple unit dosage form, and may be prepared by any of the methods well known in the art.

35 The first and second active compounds may be administered to the lungs, i.e. intrapulmonarily, nasally, respirably or by inhalation, of a subject by any suitable means. A preferred method of administration is by generating an aerosol or spray comprised of nasal or respirable particles comprising the active compound. The thus administered particles are then inhaled by the subject, i.e. by inhalation, intrapulmonary drip, or nasal administration, or by direct administration into the airways or respiration. The respirable particles may be liquid or
40 solid, and they are preferably in the range of about 0.05, about 0.5, about 1, about 2, about 2.5 to about 3.5, about 4, about 6, about 8, about 10 micron, and preferably about 1 to about 5 micron (respirable or inhalable particles), or about 10, about 15, about 20, about 30 to about 50, about 100, about 150, about 200, about 300, about 400, about 500 micron, preferably about 10 to about 50, about 100 micron for intrapulmonary instillation or nasal administration. As explained above, particles of non-respirable size that are included in the aerosol or spray tend to
45 deposit in the throat and be swallowed, and the quantity of non-respirable particles in the aerosol is preferably minimized. For nasal administration or intrapulmonary instillation, particularly for newborn babies and infants, a particle size in the range of about 10 to about 50 microns is preferred to ensure deposition and retention in the nasal or pulmonary cavity. Liquid pharmaceutical compositions of the active compound for producing an aerosol or spray may be prepared by combining the active compound with a stable vehicle, such as sterile pyrogen free water. Solid
50 particulate compositions containing respirable dry particles of micronized active compound may be prepared by grinding dry active compound with a mortar and pestle, and then passing the micronized composition through a 400 mesh screen to break up or separate out large agglomerates. Another method would include passing through a mill

and collecting the fine particles from the device for further classification. A solid particulate composition comprised of the active compound may optionally contain a dispersant that serves to facilitate the formation of an aerosol. A suitable dispersant is lactose, which may be blended with the active compound in any suitable ratio, e. g. a 1 to 2.5 ratio by weight. Again, other therapeutic and formulation compounds may also be included, such as a surfactant to improve the state of surfactant in the lung and help with the absorption of the active agent.

The dosage of the anti-sense compound administered will depend upon the disease being treated, the condition of the subject, the particular formulation, the route of administration, the timing of administration to a subject, etc. In general, intracellular concentrations of the oligonucleotide of from about 0.01, about 0.05, about 0.1, about 0.2, about 1 to about 5 μM , about 50 μM , about 100 μM or more, and more particularly about 0.2 to about 0.5 μM , are desired. For administration to a subject such as a human, a dosage of from about 0.01, about 0.1 or about 1 mg/Kg up to about 50, about 100, or about 150 mg/Kg and even higher doses are typically employed depending on the route of administration as is known in the art. Depending on the solubility of the particular formulation of active compound administered, the daily dose may be divided among one or several unit dose administrations. Administration of the anti-sense compounds may be carried out therapeutically (i.e., as a rescue treatment) or prophylactically. Aerosols of liquid particles comprising the active compound may be produced by any suitable means, such as with a nebulizer. See, e. g. U.S. Patent No. 4,501,729. Nebulizers are commercially available devices that transform solutions or suspensions of the active ingredient into a therapeutic aerosol mist either by means of acceleration of a compressed gas, typically air or oxygen, through a narrow venturi orifice or by means of ultrasonic agitation. Suitable compositions for use in nebulizer comprise the active ingredient in a liquid carrier or diluent, the active ingredient comprising about 0.05 up to about 40% w/w of the composition, preferably about 1 to less than about 20% w/w. The carrier is typically water or a dilute aqueous alcoholic solution, preferably made isotonic with body fluids by the addition of, for example sodium chloride. Other carriers, however, are also suitable as an artisan would know. Optional additives include preservatives if the composition is not prepared sterile. An example of a preservative is methyl hydroxybenzoate, and other agents such as antioxidants, flavoring agents, volatile oils, buffering agents and surfactants, however, may also be added.

In one preferred embodiment, the pharmaceutical composition may further comprise one or more bronchodilating agents, and one or more surfactants along with a carrier and formulation agents alternatively, these active agents may be administered separately. Suitable surfactants or surfactant components for enhancing the uptake of the anti-sense oligonucleotides of the invention include synthetic and natural as well as full and truncated forms of surfactant protein A, surfactant protein B, surfactant protein C, surfactant protein D and surfactant Protein E, partially and fully saturated phosphatidylcholine (other than dipalmitoyl), dipalmitoylphosphatidylcholine, phosphatidylcholine, phosphatidylglycerol, phosphatidylinositol, phosphatidylethanolamine, phosphatidylserine; phosphatidic acid, ubiquinones, lysophosphatidylethanolamine, lysophosphatidylcholine, palmitoyl-lysophosphatidylcholine, dehydroepiandrosterone, dolichols, sulfatidic acid, glycerol-3-phosphate, dihydroxyacetone phosphate, glycerol, glycerol-3-phosphocholine, dihydroxyacetone, palmitate, cytidine diphosphate (CDP) diacylglycerol, CDP choline, choline, choline phosphate; as well as natural and artificial lamellar bodies which are the natural carrier vehicles for the components of surfactant, omega-3 fatty acids, polyenic acid, polyenoic acid, lecithin, palmitic acid, non-ionic block copolymers of ethylene or propylene oxides, polyoxypropylene, monomeric and polymeric, polyoxyethylene, monomeric and polymeric, poly (vinyl amine) with dextran and/or alkanoyl side chains, Brij 35, Triton X-100 and synthetic surfactants ALEC, Exosurf, Survan and Atovaquone, among others. These surfactants may be used either as a single, or as part of a multiple component, surfactant in a formulation, or as covalently bound additions to the 5' and/or 3' ends of the anti-sense oligo(s). Aerosols of solid particles comprising the active compound may likewise be produced with any solid particulate medicament aerosol generator. Aerosol generators for administering solid particulate medicaments to a subject produce particles which are respirable, as explained above, and generate a volume of aerosol containing a predetermined metered dose of a medicament at a rate suitable for human administration. One illustrative type of solid particulate aerosol generator is an insufflator. Suitable formulations for administration by insufflation include finely comminuted powders which may be delivered by means of an insufflator or taken into the nasal cavity in the manner of a snuff. In the insufflator, the powder (e.g., a metered dose thereof effective to carry out the treatments described herein) is contained in capsules or cartridges, typically made of gelatin or foil, which are either pierced or opened in situ and the powder delivered by air drawn through the device upon inhalation or by means of a manually-operated pump. The powder employed in the insufflator consists either solely of the active ingredient or of a powder

blend comprising the active ingredient, a suitable powder diluent, such as lactose, and an optional surfactant. The active ingredient typically comprises from about 0.1 to about 100 w/w of the formulation. A second type of illustrative aerosol generator comprises a metered dose inhaler. Metered dose inhalers are pressurized aerosol dispensers, typically containing a suspension or solution formulation of the active ingredient in a liquefied propellant. During the use these devices discharge the formulation through a valve adapted to deliver a metered volume, typically from about 10:1 to about 150:1, to produce a fine particle spray containing the active ingredient. Suitable propellants include certain chlorofluorocarbon compounds, for example, dichlorodifluoromethane, trichlorofluoromethane, dichlorotetrafluoroethane and mixtures thereof. The formulation may additionally contain one or more co-solvents, for example, ethanol, surfactants, such as oleic acid or sorbitan trioleate, antioxidants and suitable flavoring agents. The aerosol, whether formed from solid or liquid particles, may be produced by the aerosol generator for example at a rate of from about 10, about 30, about 70 to about 100, about 150, about 150 liters per minute, more preferably from about 30 to 150 liters per minute, and most preferably about 60 liters per minute. Aerosols containing greater amounts of medicament, however, may be administered more rapidly as is known in the art.

Aerosols of solid particles comprising the active compound may likewise be produced with any solid particulate medicament aerosol generator. Aerosol and spray generators for administering solid particulate medicaments to a subject, comprise product particles that are respirable or inhalable, and they generate a volume of aerosol containing a predetermined metered dose of a medicament at a rate suitable for human administration. Examples of such aerosol and spray generators include metered dose inhalers and insufflators known in the art. Liquid pharmaceutical compositions of active compound for producing an aerosol can be prepared by combining the anti-sense compound with the anti-inflammatory steroid(s) and/or the ubiquinone(s) and a suitable vehicle, such as sterile pyrogen free water. Other therapeutic compounds and formulation components may optionally be included as well. Solid particulate compositions containing respirable dry particles of micronized anti-sense compound may be prepared as known in the art, and generally described above, and then passing the micronized composition through a 400 mesh screen to break up or separate out large agglomerates.

Compositions suitable for oral administration may be presented in discrete units, such as capsules, cachets, lozenges, or tablets, each containing a pre-determined amount of the first and second active compounds; as a powder or granules; as a solution or a suspension in an aqueous or non-aqueous liquid; or as an oil-in-water or water-in-oil emulsion. Such compositions may be prepared by any suitable method of pharmacy that includes the step of bringing into association the active compounds and a suitable carrier. In general, the compositions of the invention are prepared by uniformly and intimately admixing the active compounds with a liquid or finely divided solid carrier, or both, and then, if necessary, shaping the resulting mixture. For example, tablet may be prepared by compressing or molding a powder or granules containing the active compound(s) alone, or optionally with one or more accessory ingredients. Compressed tablets may be prepared by compressing, in a suitable machine, the compound in a free-flowing form, such as a powder or granules optionally mixed with a binder, lubricant, inert diluent, and/or surface active/dispersing agent(s) or surfactants. Molded tablets may be made by molding, in a suitable machine, the powdered compound(s) moistened with an inert liquid binder. Compositions for oral administration may optionally include enteric coatings known in the art to prevent degradation of the compositions in the stomach and provide release of the drug in the small intestine.

Compositions suitable for buccal or sub-lingual administration include lozenges comprising the active compound in a flavored base, usually sucrose and acacia or tragacanth, and pastilles comprising the compound in an inert base such as gelatin and glycerin or sucrose and acacia.

Compositions suitable for parenteral administration comprise sterile aqueous and non-aqueous injection solutions, suspensions or emulsions of the active compound, which preparations are preferably isotonic with the blood of the intended recipient. These preparations may contain anti-oxidants, buffers, surfactants, bacteriostats, solutes which render the compositions isotonic with the blood of the intended recipient, and other formulation components known in the art. Aqueous and non-aqueous sterile suspensions may include suspending agents and thickening agents. The compositions may be presented in unit-dose or multi-dose containers, for example sealed ampoules and vials, and may be stored in a freeze-dried (lyophilized) condition requiring only the addition of the sterile liquid carrier, for example, saline or water-for-injection immediately prior to use. Extemporaneous injection solutions, suspensions and emulsions may be prepared from sterile powders, granules and tablets of the kind previously described.

Compositions suitable for topical application to the skin preferably take the form of an ointment, cream, lotion, paste, gel, spray, aerosol, or oil, although others are also suitable. Carriers that may be used include vaseline, lanoline, polyethylene glycols, alcohols, transdermal enhancers, and combinations of two or more thereof.

Compositions suitable for rectal and vaginal administration are also included and may be prepared by methods known in the art.

Compositions suitable for transdermal administration may be presented as discrete patches adapted to remain in intimate contact with the epidermis of the recipient for a prolonged period of time. Compositions suitable for transdermal administration may also be delivered by iontophoresis. See, e.g. *Pharmaceutical Research* 3:318 (1986). They typically take the form of an optionally buffered aqueous solution of the active compound containing appropriate ions to facilitate the iontophoretic delivery of the agent.

The relevant disclosures of all scientific publications and patent references cited in this patent are specifically intended to be incorporated herein by reference, particularly in reference to preparatory methods and technologies which are enabling of the invention. The following examples are provided to illustrate the present invention, and should not be construed as limiting thereon.

15 EXAMPLES

In the following examples, μ M means micromolar, ml means milliliters, μ m means micrometers, mm means millimeters, cm means centimeters, EC means degrees Celsius, μ g means micrograms, mg means milligrams, g means grams, kg means kilograms, M means molar, and h or hr. means hours.

Example 1: Design and Synthesis of Anti-sense Oligonucleotides

20 The design of anti-sense oligonucleotides against the A₁ and A₃ adenosine receptors may require the solution of the complex secondary structure of the target A₁ receptor mRNA and the target A₃ receptor mRNA. After generating this structure, anti-sense nucleotide are designed which target regions of mRNA which might be construed to confer functional activity or stability to the mRNA and which optimally may overlap the initiation codon. Other target sites are readily usable. As a demonstration of specificity of the anti-sense effect, other
25 oligonucleotides not totally complementary to the target mRNA, but containing identical nucleotide compositions on a w/w basis, are included as controls in anti-sense experiments.

The mRNA secondary structure of the adenosine A₁ receptor was analyzed and used as described above. to design a phosphorothioate anti-sense oligonucleotide. The anti-sense oligonucleotide which was synthesized was designated HAdA₁AS and had the following sequence: 5' -GAT GGA GGG CGG CAT GGC GGG-3' (SEQ ID
30 NO:9370). As a control, a mismatched phosphorothioate anti-sense nucleotide designated HAdA₁MM1 was synthesized with the following sequence: 5' -GTA GCA GGC GGG GAT GGG GGC-3' (SEQ ID NO:9371). Each oligonucleotide had identical base content and general sequence structure. Homology searches in GENBANK (release 85.0) and EMBL (release 40.0) indicated that the anti-sense oligonucleotide was specific for the human and rabbit adenosine A₁ receptor genes, and that the mismatched control was not a candidate for hybridization with any
35 known gene sequence.

The secondary structure of the adenosine A₃ receptor mRNA was similarly analyzed and used as described above to design two phosphorothioate anti-sense oligonucleotides. The first anti-sense oligonucleotide (HAdA₃AS1) synthesized had the following sequence: 5' -GTT GTT GGG CAT CTT GCC-3' (SEQ ID
40 NO:9372). As a control, a mismatched phosphorothioate anti-sense oligonucleotide (HAdA₃MM1) was synthesized, having the following sequence: 5' -GTA CTT GCG GAT CTA GGC-3' (SEQ ID NO:9373). A second phosphorothioate anti-sense oligonucleotide (HAdA₃AS2) was also designed and synthesized, having the following sequence: 5' -GTG GGC CTA GCT CTC GCC-3' (SEQ ID NO:9374). Its control oligonucleotide (HAdA₃MM2) had the sequence: 5' -GTC GGG GTA CCT GTC GGC-3' (SEQ ID NO:9375). Phosphorothioate oligonucleotides were synthesized on an Applied Biosystems Model 396 Oligonucleotide Synthesizer, and purified
45 using NENSORB chromatography (DuPont, MD).

Example 2: In Vivo Testing of Adenosine A₁ Receptor Anti-sense Oligos

The anti-sense oligonucleotide against the human A₁ receptor (SEQ ID NO:9370) described above. was tested for efficacy in an in vitro model utilizing lung adenocarcinoma cells HTB-54. HTB-54 lung adenocarcinoma
50 cells were demonstrated to express the A₁ adenosine receptor using standard northern blotting procedures and

receptor probes designed and synthesized in the laboratory.

HTB-54 human lung adenocarcinoma cells (106/100 mm tissue culture dish) were exposed to 5.0 :M HAdA1AS or HAdAIMM1 for 24 hours, with a fresh change of media and oligonucleotides after 12 hours of incubation. Following 24 hour exposure to the oligonucleotides, cells were harvested and their RNA extracted by standard procedures. A 21-mer probe corresponding to the region of mRNA targeted by the anti-sense (and therefore having the same sequence as the anti-sense, but not phosphorothioated) was synthesized and used to probe northern blots of RNA prepared from HAdA1AS-treated, HAdAIMM1-treated and non-treated HTB-54 cells. These blots showed clearly that HAdA1AS but not HAdAIMM1 effectively reduced human adenosine receptor mRNA by >50%. This result showed that HAdA1AS is a good candidate for an anti-asthma drug since it depletes intracellular mRNA for the adenosine A₁ receptor, which is involved in asthma.

Example 3: In Vivo Efficacy of Adenosine A₁ Receptor Anti-sense Oligos

A fortuitous homology between the rabbit and human DNA sequences within the adenosine A₁ gene overlapping the initiation codon permitted the use of the phosphorothioate anti-sense oligonucleotides initially designed for use against the human adenosine A₁ receptor in a rabbit model. Neonatal New Zealand white Pasturella-free rabbits were immunized intraperitoneally within 24 hours of birth with 312 antigen units/ml house dust mite (*D. farinae*) extract (Berkeley Biologicals, Berkeley, CA), mixed with 10% kaolin. Immunizations were repeated weekly for the first month and then biweekly for the next 2 months. At 3-4 months of age, eight sensitized rabbits were anesthetized and relaxed with a mixture of ketamine hydrochloride (44 mg/kg) and acepromazine maleate (0.4 mg/kg) administered intramuscularly. The rabbits were then laid supine in a comfortable position on a small molded, padded animal board and intubated with a 4.0-mm intratracheal tube (Mallinkrodt, Inc., Glens Falls, NY). A polyethylene catheter of external diameter 2.4 mm with an attached latex balloon was passed into the esophagus and maintained at the same distance (approximately 16 cm) from the mouth throughout the experiments. The intratracheal tube was attached to a heated Fleisch pneumotachograph (size 00; DOM Medical, Richmond, VA), and flow was measured using a Validyne differential pressure transducer (Model DP-45161927; Validyne Engineering Corp., Northridge, CA) driven by a Gould carrier amplifier (Model 11-4113; Gould Electronic, Cleveland, OH). The esophageal balloon was attached to one side of the differential pressure transducer, and the outflow of the intratracheal tube was connected to the opposite side of the pressure transducer to allow recording of transpulmonary pressure. Flow was integrated to give a continuous tidal volume, and measurements of total lung resistance (RL) and dynamic compliance (C_{dyn}) were calculated at isovolumetric and flow zero points, respectively, using an automated respiratory analyzer (Model 6; Buxco, Sharon, CT). Animals were randomized and on Day 1 pretreatment values for PC₅₀ were obtained for aerosolized adenosine. Anti-sense (HAdA1AS) or mismatched control (HAdAIMM) oligonucleotides were dissolved in sterile physiological saline at a concentration of 5000 µg (5 mg) per 1.0 ml. Animals were subsequently administered the aerosolized anti-sense or mismatch oligonucleotide via the intratracheal tube (approximately 5000 µg in a volume of 1.0 ml), twice daily for two days. Aerosols of either saline, adenosine, or anti-sense or mismatch oligonucleotides were generated by an ultrasonic nebulizer (DeVilbiss, Somerset, PA), producing aerosol droplets 80% of which were smaller than 5 µm in diameter. In the first arm of the experiment, four randomly selected allergic rabbits were administered anti-sense oligonucleotide and four the mismatched control oligonucleotide. On the morning of the third day, PC₅₀ values (the concentration of aerosolized adenosine in mg/ml required to reduce the dynamic compliance of the bronchial airway 50% from the baseline value) were obtained and compared to PC₅₀ values obtained for these animals prior to exposure to oligonucleotide. Following a 1 week interval, animals were crossed over, with those previously administered mismatch control oligonucleotide now administered anti-sense oligonucleotide, and those previously treated with anti-sense oligonucleotide now administered mismatch control oligonucleotide. Treatment methods and measurements were identical to those employed in the first arm of the experiment. It should be noted that in six of the eight animals treated with anti-sense oligonucleotide, adenosine-mediated bronchoconstriction could not be obtained up to the limit of solubility of adenosine, 20 mg/ml. For the purpose of calculation, PC₅₀ values for these animals were set at 20 mg/ml. The values given therefore represent a minimum figure for anti-sense effectiveness. Actual effectiveness was higher. The results of this experiment are illustrated in Table 5 below.

Table 5: Effect of Adenosine A₁ Receptor Anti-sense Oligo upon PC₅₀ Values in Asthmatic Rabbits

Mismatch Control		A ₁ Receptor Anti-sense Oligo	
Pre Oligonucleotide	Post Oligonucleotide	Pre Oligonucleotide	Post Oligonucleotide
3.56 ± 1.02	5.16 ± 1.03	2.36 ± 0.68	>19.5 ± 0.34**

The results are presented as the mean (n=8) ± SEM.

5 The significance was determined by repeated-measures analysis of variance (ANOVA), and Tukey's protected test.

**Significantly different from all other groups, p<0.01.

In both arms of the experiment, animals receiving the anti-sense oligonucleotide showed an order of magnitude increase in the dose of aerosolized adenosine required to reduce dynamic compliance of the lung by 50%. No effect of the mismatched control oligonucleotide upon PC₅₀ values was observed. No toxicity was observed in any animal receiving either anti-sense or control inhaled oligonucleotide. These results show clearly that the lung has exceptional potential as a target for anti-sense oligonucleotide-based therapeutic intervention in lung disease. They further show, in a model system which closely resembles human asthma, that downregulation of the adenosine A₁ receptor largely eliminates adenosine-mediated bronchoconstriction in asthmatic airways. Bronchial hyperresponsiveness in the allergic rabbit model of human asthma is an excellent endpoint for anti-sense intervention since the tissues involved in this response lie near to the point of contact with aerosolized oligonucleotides, and the model closely simulates an important human disease.

Example 4: Specificity of A₁-adenosine Receptor Anti-sense Oligonucleotide

At the conclusion of the cross-over experiment of Example 3 above, airway smooth muscle from all rabbits was quantitatively analyzed for adenosine A₁ receptor number. As a control for the specificity of the anti-sense oligonucleotide, adenosine A₂ receptors, which should not have been affected, were also quantified. Airway smooth muscle tissue was dissected from each rabbit and a membrane fraction prepared according to the method of Kleinstein et al. (Kleinstein, J. and Glossmann, H., Naunyn-Schmiedeberg's Arch. Pharmacol. 305: 191-200 (1978)), the relevant portion of which is hereby incorporated in its entirety by reference, with slight modifications. Crude plasma membrane preparations were stored at -70EC until the time of assay. Protein content was determined by the method of Bradford (M. Bradford, Anal. Biochem. 72, 240-254 (1976), the relevant portion of which is hereby incorporated in its entirety by reference). Frozen plasma membranes were thawed at room temperature and were incubated with 0.2 U/ml adenosine deaminase for 30 minutes at 37EC to remove endogenous adenosine. The binding of [³H] DPCPX (A₁ receptor-specific) or [³H] CGS-21680 (A₁ receptor-specific) was measured as previously described by Ali et al. (Ali, S. et al., J. Pharmacol. Exp. Ther. 268, Am. J. Physiol 266, L271-277 (1994), the relevant portion of which is hereby incorporated in its entirety by reference). The animals treated with adenosine A₁ anti-sense oligonucleotide in the cross-over experiment had a nearly 75% decrease in A₁ receptor number compared to controls, as assayed by specific binding of the A₁-specific antagonist DPCPX. There was no change in adenosine A₂ receptor number, as assayed by specific binding of the A₂ receptor-specific agonist 2- [p- (2-carboxyethyl)-phenethylamino] -5' - (N-ethylcarboxamido) adenosine (CGS-21680). This is illustrated in Table 6 below.

Table 6: Specificity of Action of Adenosine A₁ Receptor Oligonucleotide Anti-sense

Mismatch Control		A ₁ Anti-sense	
Oligonucleotide		Oligonucleotide	
A ₁ -Specific Binding	1105 ± 48**	A ₁ -Specific Binding	293 ± 18
A ₂ -Specific Binding	302 ± 22	A ₂ -Specific Binding	442 ± 171

40 The results are presented as the mean (n = 8) ± SEM.

The significance was determined by repeated-measures analysis of variance (ANOVA), and Tukey's protected test.

**Significantly different from mismatch control, p<0.01.

The above results illustrate the effectiveness of anti-sense oligonucleotides in treating airway disease. Since the anti-sense oligos described above, eliminate the receptor systems responsible for adenosine-mediated bronchoconstriction, it may be less imperative to eliminate adenosine from them. However, it would be preferable to eliminate adenosine from even these oligonucleotides to reduce the dose needed to attain a similar effect. Described

above are other anti-sense oligonucleotides targeting mRNA of proteins involved in inflammation. Adenosine has been eliminated from their nucleotide content to prevent its liberation during degradation.

Example 5: Anti-sense Oligos directed to other Target Nucleic Acids

This work was conducted to demonstrate that the present invention is broadly applicable to anti-sense oligonucleotides ("oligos") specific to nucleic acid targets broadly. The following experimental studies were conducted to show that the method of the invention is broadly suitable for use with anti-sense oligos designed as taught by this application and targeted to any and all adenosine receptor mRNAs. For this purpose, various anti-sense oligos were prepared to adenosine receptor mRNAs exemplified by the adenosine A₁, A_{2b} and A₃ receptor mRNAs. Anti-sense Oligo I was disclosed above (SEQ ID NO:9370). Five additional anti-sense phosphorothioate oligos were designed and synthesized as indicated above.

- 1- Oligo II (SEQ ID NO: 9376) also targeted to the adenosine A₁ receptor, but to a different region than Oligo I.
- 2- Oligo V (SEQ ID NO: 9379) targeted to the adenosine A_{2b} receptor.
- 3- Oligos III (SEQ ID NO: 9377) and IV (SEQ ID NO: 9378) targeted to different regions of the adenosine A₃ receptor.
- 4- Oligo I-PD (SEQ ID NO: 11050) (a phosphodiester oligo of the same sequence as Oligo I).

These anti-sense oligos were designed for therapy on a selected species as described above and are generally specific for that species, unless the segment of the target mRNA of other species happens to contain a similar sequences. All anti-sense oligos were prepared as described below, and tested in vivo in a rabbit model for bronchoconstriction, inflammation and allergy, which have breathing difficulties and impeded lung airways, as is the case in ailments such as asthma, as described in the above-identified application.

Example 6: Design & Sequences of other Anti-sense Oligos

Six oligos and their effects in a rabbit model were studied and the results of these studies are reported and discussed below. Five of these oligos were selected for this study to complement the data on Oligo I (SEQ ID NO: 9370) provided in Examples 1 to 4 above. This oligo is anti-sense to one region of the adenosine A₁ receptor mRNA. The oligos tested are identified as anti-sense Oligos I (SEQ ID NO: 9370) and II (SEQ ID NO: 9376) targeted to a different region of the adenosine A₁ receptor mRNA, Oligo V (SEQ ID NO: 9377) targeted to the adenosine A_{2b} receptor mRNA, and anti-sense Oligos III and IV (SEQ ID NOS: 9378 and 9379) targeted to two different regions of the adenosine A₃ receptor mRNA. The sixth oligo (Oligo I-PD) is a phosphodiester version of Oligo I (SEQ ID NO: 9370). The design and synthesis of these anti-sense oligos was performed in accordance with Example 1 above.

(I) Anti-sense Oligo I

The anti-sense oligonucleotide I referred to in Examples 1 to 4 above is targeted to the human A₁ adenosine receptor mRNA (EPI 2010). Anti-sense oligo I is 21 nucleotide long, overlaps the initiation codon, and has the following sequence: 5'-GAT GGA GGG CGG CAT GGC GGG-3' (SEQ ID NO: 9370). The oligo I was previously shown to abrogate the adenosine-induced bronchoconstriction in allergic rabbits, and to reduce allergen-induced airway obstruction and bronchial hyperresponsiveness (BHR), as discussed above and shown by Nyce, J. W. & Metzger, W. J., Nature, 385:721 (1977), the relevant portions of which reference are incorporated in their entirety herein by reference.

(II) Anti-sense Oligo II

A phosphorothioate anti-sense oligo (SEQ ID NO: 9376) was designed in accordance with the invention to target the rabbit adenosine A₁ receptor mRNA region +936 to +956 relative to the initiation codon (start site). The anti-sense oligo II is 21 nucleotide long, and has the following sequence: 5'-CTC GTC GCC GTC GCC GGC GGG-3' (SEQ ID NO: 9376).

(III) Anti-sense Oligo III

A phosphorothioate anti-sense oligo other than that provided in Example 1 above (SEQ ID NO: 9377) was designed in accordance with the invention to target the anti-sense A₃ receptor mRNA region +3 to +22 relative to the initiation codon start site. The anti-sense oligo III is 20 nucleotide long, and has the following sequence: 5'-GGG TGG TGC TAT TGT CGG GC-3' (SEQ ID NO: 9377).

(IV) Anti-sense Oligo IV

Yet another phosphorothioate anti-sense oligo (SEQ ID NO: 9378) was designed in accordance with the invention to target the adenosine A₃ receptor mRNA region +386 to +401 relative to the initiation codon (start site). The anti-sense oligo IV is 15 nucleotide long, and has the following sequence: 5'-GGC CCA GGC CCA

GCC-3' (SEQ ID NO:9378)

(V) Anti-sense Oligo V

A phosphorothioate anti-sense oligo (SEQ ID NO:9379) was designed in accordance with the invention to target the adenosine A_{2b} receptor mRNA region -21 to -1 relative to the initiation codon (start site). The anti-sense oligonucleotide V is 21 nucleotide long, and has the following sequence: 5'-GGC CGG GCC AGC CGG GCC CGG-3' (SEQ ID NO:9379).

(VI) A₁ Mismatch Oligos

Two different mismatched oligonucleotides having the following sequences were used as controls for anti-sense oligo I (SEQ ID NO: 1) described in Example 5 above: A₁ MM2:5'-GTA GGT GGC GGG CAA GGC GGG-3' (SEQ ID NO:12490), and A₁ MM3:5'-GAT GGA GGC GGG CAT GGC GGG-3' (SEQ ID NO:12489). Anti-sense oligo I and the two mismatch anti-sense oligos had identical base content and general sequence structure. Homology searches in GENBANK (release 85.0) and EMBL (release 40.0) indicated that the anti-sense oligo I was specific, not only for the human, but also for the rabbit, adenosine A₁ receptor genes, and that the mismatched controls were not candidates for hybridization with any known human or animal gene sequence.

(VII) Anti-sense Oligo A₁-PD (Oligo VI)

A phosphodiester anti-sense oligo (Oligo VI; SEQ ID NO:9370) having the same nucleotide sequence as Oligo I was designed as disclosed in the above-identified application. Anti-sense oligo I-PD is 21 nucleotide long, overlaps the initiation codon, and has the following sequence: 5'- GAT GGA GGC CGG CAT GGC GGG-3' (SEQ ID NO:9370).

(III) Controls

Each rabbit was administered 5.0 ml aerosolized sterile saline following the same schedule as for the anti-sense oligos in (II), (III), and (IV) above.

Example 7: Synthesis of Anti-sense Oligos

Phosphorothioate anti-sense oligos having the sequences described in (a) above, were synthesized on an Applied Biosystems Model 396 Oligonucleotide Synthesizer, and purified using NENSORB chromatography (DuPont, DE). TETD (tetraethylthiuram disulfide) was used as the sulfurizing agent during the synthesis. Anti-sense oligonucleotide II (SEQ ID NO:9376), anti-sense oligonucleotide III (SEQ ID NO: 9377) and anti-sense oligonucleotide IV (SEQ ID NO: 9378) were each synthesized and purified in this manner.

Example 8: Preparation of Allergic Rabbits

Neonatal New Zealand white Pasturella-free rabbits were immunized intraperitoneally within 24 hours of birth with 0.5 ml of 312 antigen units/ml house dust mite (*D. farinae*) extract (Berkeley Biologicals, Berkeley, CA) mixed with 10% kaolin as previously described (Metzger, W. J., in Late Phase Allergic Reactions, Dorsch, W., Ed., CRC Handbook, pp. 347-362, CRC Press, Boca Raton (1990); Ali, S., Metzger, W. J. and Mustafa, S. J., Am. J. Resp. Crit. Care Med. 149: 908 (1994)), the relevant portions of which are incorporated in their entireties here by reference. Immunizations were repeated weekly for the first month and then biweekly until the age of 4 months. These rabbits preferentially produce allergen-specific IgE antibody, typically respond to aeroallergen challenge with both an early and late-phase asthmatic response, and show bronchial hyper responsiveness (BHR). Monthly intraperitoneal administration of allergen (312 units dust mite allergen, as above) continues to stimulate and maintain allergen-specific IgE antibody and BHR. At 4 months of age, sensitized rabbits were prepared for aerosol administration as described by Ali et al. (Ali, S., Metzger, W. J. and Mustafa, S. J., Am. J. Resp. Crit. Care Med. 149 (1994)), the relevant section being incorporated in its entirety here by reference.

DOSE-RESPONSE STUDIES

Example 9: Experimental Setup

Aerosols of either adenosine (0-20 mg/ml), or anti-sense or one of two mismatch oligonucleotides (5 mg/ml) were separately prepared with an ultrasonic nebulizer (Model 646, DeVilbiss, Somerset, PA), which produced aerosol droplets, 80% of which were smaller than 5µm in diameter. Equal volumes of the aerosols were administered directly to the lungs via an intratracheal tube. The animals were randomized, and administered aerosolized adenosine. Day 1 pre-treatment values for sensitivity to adenosine were calculated as the dose of adenosine causing a 50% loss of compliance (PC₅₀ Adenosine). The animals were then administered either the aerosolized anti-sense or one of the mismatch anti-sense oligos via the intratracheal tube (5 mg/1.0 ml), for 2 minutes, twice daily for 2

days (total dose, 20 mg). Post-treatment PC₅₀ values were recorded (post-treatment challenge) on the morning of the third day. The results of these studies are provided in Example 21 below.

Example 10: Crossover Experiments

For some experiments utilizing anti-sense oligo I (SEQ ID NO: 9370) and a corresponding mismatch control oligonucleotide A₁MM2, following a 2 week interval, the animals were crossed over, with those previously administered the mismatch control A₁MM2, now receiving the anti-sense oligo I, and those previously treated with the anti-sense oligo I, now receiving the mismatch control A₁MM2 oligo. The number of animals per group was as follows. For mismatch A₁MM2 (Control 1), n=7, since one animal was lost in the second control arm of the experiment due to technical difficulties, for mismatch A₁MM3 n=4 (Control 2) and for A₁AS anti-sense oligo I, n=8. The A₁MM3 oligo-treated animals were analyzed separately and were not part of the cross-over experiment. The treatment methods and measurements employed following the cross-over were identical to those employed in the first arm of the experiment. In 6 of the 8 animals treated with the anti-sense oligo I (SEQ ID NO: 9370), no PC₅₀ value could be obtained for adenosine doses of up to 20 mg/ml, which is the limit of solubility of adenosine. Accordingly, the PC₅₀ values for these animals were assumed to be 20 mg/ml for calculation purposes. The values given, therefore, represent a minimum figure for the effectiveness of the anti-sense oligonucleotides of the invention. Other groups of allergic rabbits (n=4 for each group) were administered 0.5 or 0.05 mg doses of the anti-sense oligo I (SEQ ID NO: 9370), or the A₁MM2 oligo in the manner and according to the schedule described above (the total doses being 2.0 or 0.2 mg). The results of these studies are provided in Example 22 below.

Example 11: Anti-sense Oligo Formulation

Each one of anti-sense oligos were separately solubilized in an aqueous solution and administered as described for anti-sense oligo I (SEQ ID NO: 9370) in (e) above, in four 5 mg aliquots (20 mg total dose) by means of a nebulizer via endotracheal tube, as described above. The results obtained for anti-sense oligo I and its mismatch controls confirmed that the mismatch controls are equivalent to saline, as described in Example 19 below and in Table 1 of Nyce & Metzger, Nature 385: 721-725 (1997). Because of this finding, saline was used as a control for pulmonary function studies employing anti-sense oligos II, III and IV (SEQ ID NO: 9376, 9377 and 9378).

Example 12: Specificity of Oligo I for Adenosine A₁ Receptor (Receptor Binding Studies)

Tissue from airway smooth muscle was dissected to primary, secondary and tertiary bronchi from rabbits which had been administered 20 mg oligo I (SEQ ID NO: 9370) in 4 divided doses over a period of 48 hours as described above. A membrane fraction was prepared according to the method of Ali et al. (Ali, S., et al., Am. J. Resp. Crit. Care Med. 149: 908 (1994), the relevant section relating to the preparation of the membrane fraction is incorporated in its entirety hereby by reference). The protein content was determined by the method of Bradford and plasma membranes were incubated with 0.2 U/ml adenosine deaminase for 30 minutes at 37EC to remove endogenous adenosine. See, Bradford, M. M. Anal. Biochem. 72, 240-254 (1976), the relevant portion of which is hereby incorporated in its entirety by reference. The binding of [³H]DPCPX, [³H]NPC17731, or [³H]CGS-21680 was measured as described by Jarvis et al. See, Jarvis, M.F., et al., Pharmacol. Exptl. Ther. 251, 888-893 (1989), the relevant portion of which is fully incorporated herein by reference. The results of this study are shown in Table 8 and discussed in Example 20 below.

**Example 13: Pulmonary Function Measurements
(Compliance c_{DYN} and Resistance)**

At 4 months of age, the immunized animals were anesthetized and relaxed with 1.5 ml of a mixture of ketamine HCl (35 mg/kg) and acepromazine maleate (1.5 mg/kg) administered intramuscularly. After induction of anesthesia, allergic rabbits were comfortably positioned supine on a soft molded animal board. Salve was applied to the eyes to prevent drying, and they were closed. The animals were then intubated with a 4.0 mm intermediate high-low cuffed Murphy 1 endotracheal tube (Mallinckrodt, Glen Falls, NY), as previously described by Zavala and Rhodes. See, Zavala and Rhodes, Proc. Soc. Exp. Biol. Med. 144: 509-512 (1973), the relevant portion of which is incorporated herein by reference in its entirety. A polyethylene catheter of OD 2.4 mm (Becton Dickinson, Clay Adams, Parsippany NJ) with an attached thin-walled latex balloon was passed into the esophagus and maintained at the same distance (approximately 16 cm) from the mouth throughout the experiment. The endotracheal tube was attached to a heated Fleisch pneumotach (size 00; DEM Medical, Richmond, VA), and the flow (v) measured using

a Validyne differential pressure transducer (Model DP-45-16-1927, Validyne Engineering, Northridge, CA), driven by a Gould carrier amplifier (Model 11-4113, Gould Electronics, Cleveland, OH). An esophageal balloon was attached to one side of the Validyne differential pressure transducer, and the other side was attached to the outflow of the endotracheal tube to obtain transpulmonary pressure (P_{tp}). The flow was integrated to yield a continuous tidal volume, and the measurements of total lung resistance (R_t) and dynamic compliance (C_{dyn}) were made at isovolumetric and zero flow points. The flow, volume and pressure were recorded on an eight channel Gould 2000 W high-frequency recorder and C_{dyn} was calculated using the total volume and the difference in P_{tp} at zero flow, and R_t was calculated as the ratio of P_{tp} and V at midtidal lung volumes. These calculations were made automatically with the Buxco automated pulmonary mechanics respiratory analyzer (Model 6, Buxco Electronics, Sharon, CT), as previously described by Giles et al. See, Giles et al., Arch. Int. Pharmacodyn. Ther. 194: 213-232 (1971), the relevant portion of which describing these calculations is incorporated in toto hereby by reference. The results obtained upon administration of oligo II on allergic rabbits are shown and discussed in Example 26 below.

Example 14: Measurement of Bronchial Hyperresponsiveness (BHR)

Each allergic rabbit was administered histamine by aerosol to determine their baseline hyperresponsiveness. Aerosols of either saline or histamine were generated using a DeVilbiss nebulizer (DeVilbiss, Somerset, PA) for 30 seconds and then for 2 minutes at each dose employed. The ultrasonic nebulizer produced aerosol droplets of which 80% were <5 micron in diameter. The histamine aerosol was administered in increasing concentrations (0.156 to 80 mg/ml) and measurements of pulmonary function were made after each dose. The B4R was then determined by calculating the concentration of histamine (mg/ml) required to reduce the C_{dyn} 50% from baseline (PC_{50} Histamine).

Example 15: Cardiovascular Effect of Anti-sense Oligo I

The measurement of cardiac output and other cardiovascular parameters using CardiomaxJ utilizes the principal of thermal dilution in which the change in temperature of the blood exiting the heart after a venous injection of a known volume of cool saline is monitored. A single rapid injection of cool saline was made into the right atrium via cannulation of the right jugular vein, and the corresponding changes in temperature of the mixed injectate and blood in the aortic arch were recorded via cannulation of the carotid artery by a temperature-sensing miniprobe. Twelve hours after the allergic rabbits had been treated with aerosols of oligo I (EPI 2010; SEQ ID NO: 9370) as described in (d) above, the animals were anesthetized with 0.3 ml/kg of 80% Ketamine and 20% Xylazine. This time point coincides with previous data showing efficacy for SEQ ID NO: 9370, as is clearly shown by Nyce & Metzger, (1997), supra, the pertinent disclosure being incorporated in its entirety here by reference. A thermocouple was then inserted into the left carotid artery of each rabbit, and was then advanced 6.5 cm and secured with a silk ligature. The right jugular vein was then cannulated and a length of polyethylene tubing was inserted and secured. A thermodilution curve was then established on a CardiomaxJ II (Columbus Instruments, Ohio) by injecting sterile saline at 20EC to determine the correctness of positioning of the thermocouple probe. After establishing the correctness of the position of the thermocouple, the femoral artery and vein were isolated. The femoral vein was used as a portal for drug injections, and the femoral artery for blood pressure and heart rate measurements. Once constant baseline cardiovascular parameters were established, CardiomaxJ measurements of blood pressure, heart rate, cardiac output, total peripheral resistance, and cardiac contractility were made.

Example 16: Duration of Action of Oligo I (SEQ ID NO: 9370)

Eight allergic rabbits received initially increasing log doses of adenosine by means of a nebulizer via an intra-tracheal tube as described in (f) above, beginning with 0.156 mg/ml until compliance was reduced by 50% (PC_{50} Adenosine) to establish a baseline. Six of the rabbits then received four 5 mg aerosolized doses of (SEQ ID NO: 9370) as described above. Two rabbits received equivalent amounts of saline vehicle as controls. Beginning 18 hours after the last treatment, the PC_{50} Adenosine values were tested again. After this point, the measurements were continued for all animals each day, for up to 10 days. The results of this study are discussed in Example 25 below.

Example 17: Reduction of Adenosine A_{2b} Receptor Number by Anti-sense Oligo V

Sprague Dawley rats were administered 2.0 mg respirable anti-sense oligo V (SEQ ID NO:9379) three times over two days using an inhalation chamber as described above. Twelve hours after the last administration, lung parenchymal tissue was dissected and assayed for adenosine A_{2b} receptor binding using $[311]$ -NECA as described by Nyce & Metzger (1997), supra. Controls were conducted by administration of equal volumes of saline.

The results are significant at $p < 0.05$ using Student's paired t test, and are discussed in Example 28 below.

**Example 18: Comparison of Oligo I & Corresponding
Phosphodiester Oligo VI (SEQ ID NO:11050)**

Oligo I (SEQ ID NO:9370) countered the effects of adenosine and eliminated sensitivity to it for adenosine amount up to 20 mg adenosine/5.0 ml (the limit of solubility of adenosine). Oligo VI (SEQ ID NO: 11050), the phosphodiester version of the oligonucleotide sequence, was completely ineffective when tested in the same manner. Both compounds have identical sequence, differing only in the presence of phosphorothioate residues in Oligo I (SEQ ID NO:9370), and were delivered as an aerosol as described above and in Nyce & Metzger (1997), supra. Significantly different at $p < 0.001$, Student's paired t test. The results are discussed in Example 29 below.

10 RESULTS OBTAINED FOR ANTI-SENSE OLIGO I (SEQ ID NO: 1)

Example 19: Results of Prior Work

The nucleotide sequence and other data for anti-sense oligo I (SEQ ID NO: 9370), which is specific for the adenosine A₁ receptor, were provided above. The experimental data showing the effectiveness of oligo I in down regulating the receptor number and activity were also provided above. Further information on the characteristics and activities of anti-sense oligo I is provided in Nyce, J. W. and Metzger, W. J., Nature 385:721 (1997), the relevant parts of which relating to the following results are incorporated in their entireties herein by reference. The Nyce & Metzger (1997) publication provided data showing that the anti-sense oligo I (SEQ ID NO: 9370):

- (1) The anti-sense oligo I reduces the number of adenosine A₁ receptors in the bronchial smooth muscle of allergic rabbits in a dose-dependent manner as may be seen in Table 5 below.
- (2) Anti-sense Oligo I attenuates adenosine-induced bronchoconstriction and allergen-induced bronchoconstriction.
- (3) The Oligo I attenuates bronchial hyperresponsiveness as measured by PC₅₀ histamine, a standard measurement to assess bronchial hyperresponsiveness. This result clearly demonstrates anti-inflammatory activity of the anti-sense oligo I as is shown in Table 5 above.
- (4) As expected, because it was designed to target it, the anti-sense oligo I is totally specific for the adenosine A₁ receptor, and has no effect at all at any dose on either the very closely related adenosine A₂ receptor or the related bradykinin B₂ receptor. This is seen in Table 5 below.
- (5) In contradistinction to the above effects of the Oligo I, the mismatch control molecules MM2 and MM3 (SEQ ID NO:11051 and SEQ ID NO:11052) which have identical base composition and molecular weight but differed from the anti-sense oligo I (SEQ ID NO: 9370) by 6 and 2 mismatches, respectively. These mismatches, which are the minimum possible while still retaining identical base composition, produced absolutely no effect upon any of the targeted receptors (A₁, A₂ or B₂).

These results, along with a complete lack of prior art on the use of anti-sense oligonucleotides, such as oligo I, targeted to the adenosine A₁ receptor, are unexpected results. The showings presented in this patent clearly enable and demonstrate the effectiveness, for their intended use, of the claimed agents and method for treating a disease or condition associated with lung airway, such as bronchoconstriction, inflammation, allergy(ies), and the like.

**Example 20: Oligo I Significantly Reduces
Response to Adenosine Challenge**

The receptor binding experiment is described in Example 12 above, and the results shown in Table 5 below which shows the binding characteristics of the adenosine A₁-selective ligand [³H]DPCPX and the bradykinin B₂-selective ligand [³H]NPC 17731 in membranes isolated from airway smooth muscle of A₁ adenosine receptor and B₂ bradykinin receptor anti-sense- and mismatch-treated allergic rabbits.

Table 5: Binding Characteristics of Three Anti-Sense Oligos

Treatment ¹	A ₁ receptor		B ₂ receptor	
	Kd	B _{max}	Kd	B _{max}

Adenosine A ₁	Receptor			
20 mg	0.36±0.029 nM	19±1.52 fmoles*	0.39±0.031 nM	14.8±0.99fmoles
2 mg	0.38±0.030 nM	32±2.56 fmoles*	0.41±0.028 nM	15.5±1.08 fmoles
0.2 mg	0.37±0.030 nM	49±3.43 fmoles	0.34±0.024 nM	15.0±1.06 fmoles
A ₁ MM1	(Control)			
20 mg	0.34±0.027 nM	52.0±3.64 fmoles	0.35±0.024 nM	14.0±1.0 fmoles
2 mg	0.37±0.033 nM	51.8±3.88 fmoles	0.38±0.028 nM	14.6±1.02 fmoles
B ₂ A (Bradykinin	Receptor)			
20 mg	0.36±0.028 nM	45.0±3.15 fmoles	0.38±0.027 nM	8.7±0.62 fmoles*
2 mg	0.39±0.035 nM	44.3±2.90 fmoles	0.34±0.024 nM	11.9±0.76
0.2 mg	0.40±0.028 nM	47.0±3.76 fmoles	0.35±0.028 nM	15.1±1.05 fmoles
B ₂ MM (Control)				
20 mg	0.39±0.031 nM	42.0±2.94 fmoles	0.41±0.029 nM	14.0±0.98 fmoles
2 mg	0.41±0.035 nM	40.0±3.20 fmoles	0.37±0.030 nM	14.8±0.99 fmoles
0.2 mg	0.37±0.029 nM	43.0±3.14 fmoles	0.36±0.025 nM	15.1±1.35 fmoles
Saline Control	0.37±0.041	46.0±5.21	0.39±0.047 nM	14.2±1.35 fmoles

Example 21: Dose-response Effect of Oligo I

Anti-sense oligo I (SEQ ID NO:9370) was found to reduce the effect of adenosine administration to the animal in a dose-dependent manner over the dose range tested as shown in Table 6 below.

5 **Table 6: Dose-Response Effect to Anti-sense Oligo I**

Total Dose (mg)	PC ₅₀ Adenosine (mg Adenosine)
Anti-sense Oligo I	
0.2	8.32±7.2
10 2.0	14.0±7.2
20	19.5±0.34
A₁MM2 oligo (control)	
0.2	2.51±0.46
2.0	3.13± 0.71
15 20	3.25± 0.34

The above results were studied with the Student's paired t test and found to be statistically different, p=0.05

20 The oligo I (SEQ ID NO:9370), an anti-adenosine A₁ receptor oligo, acts specifically on the adenosine A₁ receptor, but not on the adenosine A₂ receptors. These results stem from the treatment of rabbits with anti-sense oligo I (SEQ ID NO: 9370) or mismatch control oligo (SEQ ID NO:11051; A₁MM2) as described in Example 9 above and in Nyce & Metzger (1997), supra (four doses of 5 mg spaced 8 to 12 hours apart via nebulizer via endotracheal tube), bronchial smooth muscle tissue excised and the number of adenosine A₁ and adenosine A₂ receptors determined as reported in Nyce & Metzger (1997), supra.

25 **Example 22: Specificity of Oligo I (SEQ ID NO:9370)
for Target Gene Product**

30 Oligo I (SEQ ID NO:9370) is specific for the adenosine A₁ receptor whereas its mismatch controls had no activity. Figure 1 depicts the results obtained from the cross-over experiment described in Example 10 above and in Nyce & Metzger (1997), supra. The two mismatch controls (SEQ ID NO:11051 and SEQ ID NO:11052) evidenced no effect on the PC₅₀ Adenosine value. On the contrary, the administration of anti-sense oligo I (SEQ ID NO:9370) showed a seven-fold increase in the PC₅₀ Adenosine value. The results clearly indicate that the anti-sense oligo I (SEQ ID NO: 9370) reduces the response (attenuates the sensitivity) to exogenously administered adenosine

when compared with a saline control. The results provided in Table 6 above clearly establish that the effect of the anti-sense oligo I is dose dependent (see, column 3 of Table 5). The Oligo I was also shown to be totally specific for the adenosine A₁ receptor, (see, top 3 rows of Table), inducing no activity at either the closely related adenosine A₂ receptor or the bradykinin B₂ receptor (see, lines 8-10 of Table 6 above). In addition, the results shown in Table 6 establish that the anti-sense oligo I (SEQ ID NO:9370) decreases sensitivity to adenosine in a dose dependent manner, and that it does this in an anti-sense oligo-dependent manner since neither of two mismatch control oligonucleotides (A₁MM2; SEQ ID NO:11051 and A₁MM3; SEQ ID NO:11052) show any effect on PC₅₀ Adenosine values or on attenuating the number of adenosine A₁ receptors.

**Example 23: Effect on Aeroallergen-induced
Bronchoconstriction & Inflammation**

The Oligo I (SEQ ID NO:9370) was shown to significantly reduce the histamine-induced effect in the rabbit model when compared to the mismatch oligos. The effect of the anti-sense Oligo I (SEQ ID NO:9370) and the mismatch oligos (A₁MM2, SEQ ID NO:11051 and A₁MM3, SEQ ID NO:11051) on allergen-induced airway obstruction and bronchial hyperresponsiveness was assessed in allergic rabbits. The effect of the anti-sense oligo I (SEQ ID NO:9370) on allergen-induced airway obstruction was assessed. As calculated from the area under the plotted curve, the anti-sense oligo I significantly inhibited allergen-induced airway obstruction when compared with the mismatched control (55%, p<0.05; repeated measures ANOVA, and Tukey's t test). A complete lack of effect was induced by the mismatch oligo A₁MM2 (Control) on allergen induced airway obstruction. The effect of the anti-sense oligo I (SEQ ID NO:9370) on allergen-induced BHR was determined as above. As calculated from the PC₅₀ Histamine value, the anti-sense oligo I (SEQ ID NO:9370) significantly inhibited allergen-induced BHR in allergic rabbits when compared to the mismatched control (61%, p<0.05; repeated measures ANOVA, Tukey's t test). A complete lack of effect of the A₁MM mismatch control on allergen-induced BHR was observed. The results indicated that anti-sense oligo I (SEQ ID NO: 9370) is effective to protect against aeroallergen-induced bronchoconstriction (house dust mite). In addition, the anti-sense oligo I (SEQ ID NO:9370) was also found to be a potent inhibitor of dust mite-induced bronchial hyper responsiveness, as shown by its effects upon histamine sensitivity which indicates anti-inflammatory activity for anti-sense oligo I (SEQ ID NO:1). The results indicated that anti-sense oligo I (SEQ ID NO 9370) is effective to protect against aeroallergen-induced bronchoconstriction (house dust mite). In addition, the anti-sense oligo I (SEQ ID NO: 9370) was also found to be a potent inhibitor of dust mite-induced bronchial hyper responsiveness, as shown by its effects upon histamine sensitivity which indicates anti-inflammatory activity for anti-sense oligo I (SEQ ID NO: 9370). The results indicated that anti-sense oligo I (SEQ ID NO: 9370) is effective to protect against aeroallergen-induced bronchoconstriction (house dust mite). In addition, the anti-sense oligo I (SEQ ID NO: 9370) was also found to be a potent inhibitor of dust mite-induced bronchial hyper responsiveness, as shown by its effects upon histamine sensitivity which indicates anti-inflammatory activity for anti-sense oligo I (SEQ ID NO: 9370). The results indicated that anti-sense oligo I (SEQ ID NO: 9370) is effective to protect against aeroallergen-induced bronchoconstriction (house dust mite). In addition, the anti-sense oligo I (SEQ ID NO: 9370) was also found to be a potent inhibitor of dust mite-induced bronchial hyper responsiveness, as shown by its effects upon histamine sensitivity which indicates anti-inflammatory activity for anti-sense oligo I (SEQ ID NO: 9370). The results indicated that anti-sense oligo I (SEQ ID NO: 9370) is effective to protect against aeroallergen-induced bronchoconstriction (house dust mite). In addition, the anti-sense oligo I (SEQ ID NO: 9370) was also found to be a potent inhibitor of dust mite-induced bronchial hyper responsiveness, as shown by its effects upon histamine sensitivity which indicates anti-inflammatory activity for anti-sense oligo I (SEQ ID NO: 9370).

**Example 24: Anti-sense Oligo I is Free
of Deleterious Side Effects**

The Oligo I (SEQ ID NO: 9370) was shown to be free of side effects that might be toxic to the recipient. No changes in arterial blood pressure, cardiac output, stroke volume, heart rate, total peripheral resistance or heart

contractility (dPdT) were observed following administration of 2.0 or 20 mg oligo I (SEQ ID NO: 9370). The addition, the results of the measurement of cardiac output (CO), stroke volume (SV), mean arterial pressure (MAP), heart rate (HR), total peripheral resistance (TPR), and contractility (dPdT) with a CardiamaxJ apparatus (Columbus Instruments, Ohio) were assessed. These results evidenced that oligo I (SEQ ID NO: 9370) has no detrimental effect upon critical cardiovascular parameters. More particularly, this oligo does not cause hypotension. This finding is of particular importance because other phosphorothioate anti-sense oligonucleotides have been shown in the past to induce hypotension in some model systems. Furthermore, the adenosine A₁ receptor plays an important role in sinoatrial conduction within the heart. Attenuation of the adenosine A₁ receptor by anti-sense oligo I (SEQ ID NO: 9370) might be expected to result, therefore, in deleterious extrapulmonary activity in response to the downregulation of the receptor. This is not the case. The anti-sense oligo I (SEQ ID NO: 9370) does not produce any deleterious intrapulmonary effects and renders the administration of the low doses of the present anti-sense oligo free of unexpected, undesirable side effects. This demonstrates that when oligo I (SEQ ID NO: 9370) is administered directly to the lung, it does not reach the heart in significant quantities to cause deleterious effects. This is in contrast to traditional adenosine receptor antagonists like theophylline which do escape the lung and can cause deleterious, even life-threatening effects outside the lung.

Example 25: Long Lasting Effect of Oligo I

The Oligo I (SEQ ID NO: 9370) evidenced a long lasting effect as evidenced by the PC₅₀ and Resistance values obtained upon its administration prior to adenosine challenge. The duration of the effect was measured for with respect to the PC₅₀ of adenosine anti-sense oligo I when administered in four equal doses of 5 mg each by means of a nebulizer via an endotracheal tube, as described above. The effect of the agent is significant over days 1 to 8 after administration. When the effect of the anti-sense oligo I (SEQ ID NO: 9370) had disappeared, the animals were administered saline aerosols (controls), and the PC₅₀ Adenosine values for all animals were measured again. Saline-treated animals showed base line PC₅₀ adenosine values (n=6). The duration of the effect (with respect to Resistance) was measured for six allergic rabbits which were administered 20 mg of anti-sense oligo I (SEQ ID NO: 9370) as described above, upon airway resistance measured as also described above. The mean calculated duration of effect was 8.3 days for both PC₅₀ adenosine (p<0.05) and resistance (p<0.05). These results show that anti-sense oligo I (SEQ ID NO: 9370) has an extremely long duration of action, which is completely unexpected.

Example 26: Anti-sense Oligo II

Anti-sense oligo II, targeted to a different region of the adenosine A₁ receptor mRNA, was found to be highly active against the adenosine A₁-mediated effects. The experiment measured the effect of the administration of anti-sense oligo II (SEQ ID NO: 9376) upon compliance and resistance values when 20 mg anti-sense oligo II or saline (control) were administered to two groups of allergic rabbits as described above. Compliance and resistance values were measured following an administration of adenosine or saline as described above in Example 13. The effect of the anti-sense oligo of the invention was different from the control in a statistically significant manner, p<0.05 using paired t-test, compliance; p<0.01 for resistance. The results showed that anti-sense oligo II (SEQ ID NO: 9376), which targets the adenosine A₁ receptor, effectively maintains compliance and reduces resistance upon adenosine challenge.

Example 27: Antisense Oligos III and IV

Oligos III (SEQ ID NO: 9377) and IV (SEQ ID NO: 9378) were shown to be in fact specifically targeted to the adenosine A₁ receptor by their effect on reducing inflammation and the number of inflammatory cells present upon separate administration of 20 mg of the anti-sense oligos III (SEQ ID NO: 9377) and IV (SEQ ID NO: 9378) to allergic rabbits as described above. The number of inflammatory cells was determined in their bronchial lavage fluid 3 hours later by counting at least 100 viable cells per lavage. The effect of anti-sense oligos III (SEQ ID NO: 9377) and IV (SEQ ID NO: 9378) upon granulocytes, and upon total cells in bronchial lavage were assessed following exposure to dust mite allergen. The results showed that the anti-sense oligo IV (SEQ ID NO: 9378) and anti-sense oligo III (SEQ ID NO: 9377) are very potent anti-inflammatory agents in the asthmatic lung following exposure to dust mite allergen. As is known in the art, granulocytes, especially eosinophils, are the primary inflammatory cells of asthma, and the administration of anti-sense oligos III (SEQ ID NO: 9377) and IV (SEQ ID NO: 9378) reduced their numbers by 40% and 66%, respectively. Furthermore, anti-sense oligos IV (SEQ ID NO: 9378) and III (SEQ ID NO: 9376) also reduced the total number of cells in the bronchial lavage fluid by 40% and

80%, respectively. This is also an important indicator of anti-inflammatory activity by the present anti-adenosine A₃ agents of the invention. Inflammation is known to underlie bronchial hyperresponsiveness and allergen-induced bronchoconstriction in asthma. Both anti-sense oligonucleotides III (SEQ ID NO: 9377) and IV (SEQ ID NO: 9378), which are targeted to the adenosine A₃ receptor, are representative of an important new class of anti-inflammatory agents which may be designed to specifically target the lung receptors of each species.

Example 28: Anti-sense Oligo V

The anti-sense oligo V (SEQ ID NO: 9379), targeted to the adenosine A_{2b} adenosine receptor mRNA was shown to be highly effective at countering adenosine A_{2b}-mediated effects and at reducing the number of adenosine A_{2b} receptors present to less than half.

Example 29: Unexpected Superiority of Substituted over Phosphodiester-residue Oligo I-DS (SEQ ID NO:1681)

Oligos I (SEQ ID NO: 9370) and I-DS (SEQ ID NO: 11050) were separately administered to allergic rabbits as described above, and the rabbits were then challenged with adenosine. The phosphodiester oligo I-DS (SEQ ID NO: 11050) was statistically significantly less effective in countering the effect of adenosine whereas oligo I (SEQ ID NO: 9370) showed high effectiveness, evidencing a PC₅₀ Adenosine of 20 mg.

Example 30: Anti-sense Oligo VI

For the present work, I designed an additional anti-sense phosphorothioate oligo targeted to the adenosine A₁ receptor (Oligo VI). This anti-sense oligo was designed for therapy on a selected species as described in the above patent application and is generally specific for that species, unless the segment of the adenosine receptor mRNA of other species elected happens to have a similar sequence. The anti-sense oligos were prepared as described below, and tested in vivo in a rabbit model for bronchoconstriction, inflammation and lung allergy, which have breathing difficulties and impeded lung airways, as is the case in ailments such as asthma, as described in the above-identified application. One additional oligo and its effect in a rabbit model was studied and the results of the study are reported and discussed below. The present oligo (anti-sense oligo VI) was selected for this study to complement the data on SEQ ID NO: 1 (Oligo I), which is anti-sense to the adenosine A₁ receptor mRNA provided in the above-identified patent application. This additional oligo is identified as anti-sense Oligo VI, and is targeted to a different region of the adenosine A₁ receptor mRNA than Oligo I. The design and synthesis of this anti-sense oligo was performed in accordance with the teaching, particularly Example 1, of the above-identified patent application. The anti-sense Oligo VI is a phosphorothioate designed to target the coding region of the rabbit adenosine A₁ receptor mRNA region +964 to +984 relative to the initiation codon (start site). The Oligo VI was prepared as described in the above-indicated application, and is 20 nucleotides long. The Oligo VI is directed to the adenosine A₁ receptor gene, and has the following sequence: 5'-CGC CGG CGG GTG CGG GCC GG-3' (SEQ ID NO: 12491). The phosphorothioate anti-sense Oligo VI having the sequence described in (5) above, was synthesized on an Applied Biosystems Model 396 Oligonucleotide Synthesizer, and purified using NENSORB chromatography (DuPont, DE). TETD (tetraethylthiuram disulfide) was used as the sulfurizing agent during the synthesis.

Example 31: Preparation of Allergic Rabbits

Neonatal New Zealand white Pasturella-free rabbits were immunized intraperitoneally within 24 hours of birth with 0.5 ml of 312 antigen units/ml house dust mite (*D. farinae*) extract (Berkeley Biologicals, Berkeley, CA) mixed with 10% kaolin as previously described (Metzger, W. J., in Late Phase Allergic Reactions, Dorsch, W., Ed., CRC Handbook, pp 347-362, CRC Press, Boca Raton, 1990; Ali, S. Et al., Am. J. Resp. Crit. Care Med. 149: 908 (1994)). The immunizations were repeated weekly for the first month and then bi-weekly until the animals were 4 months old. These rabbits preferentially produce allergen-specific IgE antibody, typically respond to aeroallergen challenge with both an early and late-phase asthmatic response, and show bronchial hyper responsiveness (BHR). Monthly intraperitoneal administration of allergen (312 units dust mite allergen, as above) continues to stimulate and maintain allergen-specific IgE antibody and BHR. At 4 months of age, sensitized rabbits were prepared for aerosol administration as described by Ali et al. (1994), supra.

Example 32: Adenosine Aerosol Preparation

An adenosine aerosol (20 mg/ml) was prepared with an ultrasonic nebulizer (Model 646, DeVilbiss, Somerset, PA), which produced aerosol droplets, 80% of which were smaller than 5:μm in diameter. Equal volumes of the aerosols were administered directly to the lungs via an intratracheal tube to all three rabbits. The animals were then administered the aerosolized adenosine and Day 1 pre-treatment values for sensitivity to adenosine were calculated as the dose of adenosine causing a 50% loss of compliance (PC₅₀ Adenosine). The animals were then administered the aerosolized anti-sense via the intratracheal tube (5 mg/1.0 ml), for 2 minutes, twice daily for 2 days (total dose, 20 mg). Post-treatment PC₅₀ values were recorded (post-treatment challenge) on the morning of the third day. The results of these studies are provided in (9) below.

Example 33: Anti-sense Oligo Formulation

Each one of anti-sense oligos were separately solubilized in an aqueous solution and administered as described for anti-sense oligo I in (c) above, in four 5 mg aliquots (20 mg total dose) by means of a nebulizer via endotracheal tube, as described above.

Example 34: Oligo VI Reduces Response to Adenosine Challenge as well or Better than Oligo I

Oligo VI was tested in three allergic rabbits of the characteristics and readied as described in (7) above and in the above-indicated patent application. Oligo VI targets a section of the coding region of the A₁ receptor which is different from Oligo I. Both these target sequences were selected randomly from many possible coding region target sequences. The three rabbits were treated identically as previously indicated for Oligo I. Briefly, 5 mg of Oligo VI were nebulized to the rabbits twice per day at 8 hour intervals, for two days. Thereafter, PC₅₀ adenosine studies were performed on the morning of the third day and compared to pre-treatment PC₅₀ values. This protocol is described in more detail in Nyce and Metzger (Nyce & Metzger, Nature 385: 721-725 (1997)). The results obtained for the three rabbits are shown in Table 7 below.

Table 7: PC₅₀ Adenosine before & after Aerosolized Adenosine Treatment

Treatment Time	PC ₅₀ Adenosine (mg)
Pre-treatment	3.0 ±2.1
Post-treatment	>20.0*
* maximum achievable dose due to adenosine insolubility in saline	

All three animals treated with Oligo VI completely eliminated sensitivity to adenosine up to the measurable level of the agent shown in Table 7 above. That is, the administration of the Oligo VI abrogated the adenosine-induced bronchoconstriction in the three allergic rabbits. The actual efficacy of Oligo VI is, therefore, greater than could be measured in the experimental system used. By comparing with the previously submitted results for the Oligo I, it may be seen that the Oligo VI was found to be as effective, or more, than Oligo I.

Example 34: Conclusions

The work described and results discussed in the examples clearly indicates that all anti-sense oligonucleotides designed in accordance with the teachings of the above-identified application were found to be highly effective at countering or reducing effects mediated by the receptors they are targeted to: That is, each and all of the two anti-sense oligos targeting an adenosine A₁ receptor mRNA, 1 anti-sense oligo targeting an adenosine A_{2b} receptor mRNA, and the 2 anti-sense oligos targeting an A₃ receptor mRNA were shown capable of countering the effect of exogenously administered adenosine which is mediated by the specific receptor they are targeted to. The activity of the anti-sense oligos of this invention, moreover, is specific to the target and substitutively fails to inhibit another target. In addition, the results presented also show that the administration of the present agents results in extremely low or non-existent deleterious side effects or toxicity. This represents 100% success in providing agents that are highly effective and specific in the treatment of bronchoconstriction and/or inflammation. This invention is broadly applicable in the same manner to all gene(s) and corresponding mRNAs encoding proteins involved in or associated with airway diseases. A comparison of the phosphodiester and a version of the same oligonucleotide wherein the phosphodiester bonds are substituted with phosphorothioate bonds evidenced an unexpected superiority for the phosphothiorate oligonucleotide over the phosphodiester anti-sense oligo.

Example 35: In Vivo Response to Adenosine Challenge

with & without Oligo I Pretreatment

Two hyper responsive monkeys (ascaris sensitive) were challenged with inhaled adenosine, with and without pre-treatment with anti-sense oligo I (SEQ ID NO: 9370). The PC₄₀ adenosine was calculated from the data collected as being equivalent to that amount of adenosine in mg that causes a 40% decrease in dynamic compliance in hyper-responsive airways. The Oligo I (SEQ ID NO: 9370; EPI 2010) was subsequently administered at 10 mg/day for 2 days by inhalation. On the third day, the PC adenosine was again measured. The PC₄₀ adenosine value prior to treatment with Oligo I was compared side-by-side with to the PC₄₀ adenosine taken after administration of Oligo I (Figure not shown). The results of the experiment conducted with two animals showed that any sensitivity to adenosine was completely eliminated by the administration of the oligo of this invention in one animal, and substantially reduced in the second.

Example 36: Extension of the experimental Results

The method of the present invention is also practiced with anti-sense oligonucleotides targeted to many genes, mRNAs and their corresponding proteins as described above, in essentially the same manner as given above, for the treatment of various conditions in the lungs. Examples of these are Human A_{2a} adenosine receptor, Human A_{2b} adenosine receptor, Human IgE receptor β , Human Fc-epsilon receptor CD23 antigen (IgE receptor), Human IgE receptor, α subunit, Human IgE receptor, Fc epsilon R, Human histidine decarboxylase, Human beta tryptase, Human tryptase-I, Human prostaglandin D synthase, Human cyclooxygenase-2, Human eosinophil cationic protein, Human eosinophil derived neurotoxin, Human eosinophil peroxidase, Human intercellular adhesion molecule-1 (ICAM-1), Human vascular cell adhesion molecule 1 (VCAM-1), Human endothelial leukocyte adhesion molecule (ELAM-1), Human P Selectin, Human endothelial monocyte activating factor, Human IL3, Human IL4, Human IL5, Human IL6, Human monocyte-derived neutrophil chemotactic factor, Human neutrophil elastase (medullasin), Human neutrophil oxidase factor, Human cathepsin G, Human defensin 1, Human defensin 3, Human macrophage inflammatory protein-1-alpha, Human muscarinic acetylcholine receptor HM1, Human muscarinic acetylcholine receptor HM3, Human fibronectin, Human interleukin 8, Human GM-CSF, Human tumor necrosis factor α , Human leukotriene C4 synthase, Human major basic protein, and many more.

Example 37: In Vivo Effects of Folinic Acid and DHEA on Adenosine Levels

In the examples provided below, EA means an epiandrosterone, DHEA means dehydroepiandrosterone, s means seconds, mg means milligrams, kg means kilograms, kw means kilowatts, Mhz means megahertz, CoQ means a ubiquinone, and nmol means nanomoles.

Young adult male Fischer 344 rats (120 grams) were administered dehydroepiandrosterone (DHEA) (300 mg/kg) or methyltestosterone (40 mg/kg) in carboxymethylcellulose by gavage once daily for fourteen days. Folinic acid (50 mg/kg) was administered intraperitoneally once daily for fourteen days. On the fifteenth day, the animals were sacrificed by microwave pulse (1.33 kw, 2450 MHZ, 6.5 s) to the cranium, which instantly denatures all brain protein and prevents further metabolism of adenosine. Hearts were removed from animals and flash frozen in liquid nitrogen with 10 seconds of death. Liver and lungs were removed en bloc and flash frozen with 30 seconds of death. Brain tissue was subsequently dissected. Tissue adenosine was extracted, derivatized to 1, N6-ethenoadenosine and analyzed by high performance liquid chromatography (HPLC) using spectrofluorometric detection according to the method of Clark and Dar (J. of Neuroscience Methods 25:243 (1988)). Results of these experiments are summarized in Table 1 below. Results are expressed as the mean \pm SEM, with ? p<0.05 compared to control group and ψ p<0.05 compared to DHEA or methyltestosterone-treated groups.

Table 1: In Vivo Effect of DHEA, δ -1-methyltestosterone & Folinic Acid on Adenosine Levels in Various Rat Tissues

	Intracellular Adenosine (nmol/mg protein)		
	Heart	Lung	Brain
Control	10.6 \pm 0.6 (n=12)	3.1 \pm 0. (n=6)	0.5 \pm 0.04 (n=12)
DHEA (300 mg/kg)	6.7 \pm 0.5 (n=12)	2.3 \pm 0.3 (n=6)	0.19 \pm 0.01 (n=12)
Methyltestosterone (40 mg/kg)	8.3 \pm 1.0 (n=6)	N.D.	0.42 \pm 0.06 (n=6)
Methyltestost. (M) (120mg/kg)	6.0 \pm 0.4 (n=6)	N.D.	0.32 \pm 0.03 (n=6)
Folinic Acid (F.A.) (50mg/kg)	12.4 \pm 2.1 (n=5)	N.D.	0.72 \pm 0.09 (n=5)
DHEA + F.A. (300mg/kg; 50mg/kg)	11.1 \pm 0.6 (n=5)	N.D.	0.55 \pm 0.09 (n=5)
M + F.A. (120mg/kg; 50mg/kg)	9.1 \pm 0.4 (n=6)	N.D.	0.60 \pm 0.06 (n=6)
N.D. = Not Determined			

The results of these experiments indicate that rats administered DHEA or methyltestosterone daily for two weeks showed multi-organ depletion of adenosine. Depletion was dramatic in brain (60% depletion for DHEA, 34% for high dose methyltestosterone) and heart (37% depletion for DHEA, 22% depletion for high dose methyltestosterone). Co-administration of folinic acid completely abrogated steroid-mediated adenosine depletion. Folinic acid administered alone induce increase in adenosine levels for all organs studied.

Example 38: Preparation of the Experimental Model

Cell cultures, HT-29 SF cells, which represent a subline of HY-29 cells (ATCC, Rockville, Md.) and are adapted for growth in completely defined serum-free PC-1 medium (Ventrex, Portland, Me.), were obtained. Stock cultures were maintained in this medium at 37° in a humidified atmosphere containing 5% CO₂. At confluence cultures were replated after dissociation using trypsin/EDTA (Gibco, Grand Island, N.Y.) and re-fed every 24 hours. Under these conditions, the doubling time for HT-29 SF cells during logarithmic growth was 24 hours.

Example 39: Flow Cytometry

Cells were plated at 10⁵/60-mm dish in duplicate. For analysis of cell cycle distribution, cultures were exposed to either 0, 25, 50, or 200 μ M DHEA. For analysis of reversal of cell cycle effects of DHEA, cultures were exposed to either 0 or 25 μ M DHEA, and the media were supplemented with MVA, CH, RN, MVA plus CH, or MVA plus CH plus RN or were not supplemented. Cultures were trypsinized following 0, 24, 48, or 74 hours and fixed and stained using a modification of a procedure of Bauer et al., *Cancer Res.*, 46, 3173-3178 (1986). Briefly, cells were collected by centrifugation and resuspended in cold phosphate-buffered saline. Cells were fixed in 70% ethanol, washed, and resuspended in phosphate-buffered saline. One ml hypotonic stain solution [50 μ g/ml propidium iodide (Sigma Chemical Co.), 20 μ g/ml Rnase A (Boehringer Mannheim, Indianapolis, Ind.), 30 mg/ml polyethylene glycol, 0.1% Triton X-100 in 5 mM citrate buffer] was then added, and after 10 min at room temperature, 1 ml of isotonic stain solution [propidium iodide, polyethylene glycol, Triton X-100 in 0.4M NaCl] was added and the cells were analyzed using a flow cytometer, equipped with pulse width/pulse area doublet discrimination (Becton Dickinson Immunocytometry Systems, San Jose, Calif.) After calibration with fluorescent beads, a minimum of 2x10⁴ cells/sample were analyzed, data were displayed as total number of cells in each of 1024 channels of increasing fluorescence intensity, and the resulting histogram was analyzed using the Cellfit analysis program (Becton Dickinson).

Example 40: DHEA Effect on Cell Growth

Cells were plated 25,000 cells/30 mm dish in quadruplicate, and after 2 days received 0, 12.5, 25, 50, or 200 μ M DHEA. Cell number was determined 0, 24, 48, and 72 hours later using a Coulter counter (model Z, Coulter Electronics, Inc. Hialeah, Fla.). DHEA (AKZO, Basel, Switzerland) was dissolved in dimethyl sulfoxide,

filter sterilized, and stored at -20°C until use.

Figure 1 illustrates the inhibition of growth for HT-29 cells by DHEA. Points refer to numbers of cells, and bars refer to SEM. Each data point was performed in quadruplicate, and the experiment was repeated three times. Where SEM bars are not apparent, SEM was smaller than symbol. Exposure to DHEA resulted in a reduced cell number compared to controls after 72 hours in 12.5 μ M, 48 hours in 25 or 50 μ M, and 24 hours in 200 μ M DHEA, indicating that DHEA produced a time- and dose-dependent inhibition of growth.

Example 41: DHEA Effect on Cell Cycle

To examine the effects of DHEA on cell cycle distribution, HT-29 SF cells were plated (10^5 cells/60 mm dish), and 48 hours later treated with 0, 25, 50, or 200 μ M DHEA. FIG. 2 illustrates the effects of DHEA on cell cycle distribution in HT-29 SF cells. After 24, 48, and 72 hours, cells were harvested, fixed in ethanol, and stained with propidium iodide, and the DNA content/cell was determined by flow cytometric analysis. The percentage of cells in G₁, S, and G₂M phases was calculated using the Cellfit cell cycle analysis program. S phase is marked by a quadrangle for clarity. Representative histograms from duplicate determinations are shown. The experiment was repeated three times.

The cell cycle distribution in cultures treated with 25 or 50 μ M DHEA was unchanged after the initial 24 hours. However, as the time of exposure to DHEA increased, the proportion of cells in S phase progressively decreased, and the percentage of cells in G₁, S and G₂M phases was calculated using the Cellfit cell cycle analysis program. S phase is marked by a quadrangle for clarity. Representative histograms from duplicate determinations are shown. The experiment was repeated three times.

The cell cycle distribution in cultures treated with 25 or 50 μ M DHEA was unchanged after the initial 24 hours. However, as the time of exposure to DHEA increased, the proportion of cells in S phase progressively decreased and the percentage of cells in G₁ phase was increased after 72 hours. A transient increase in G₂M phase cells was apparent after 48 hours. Exposure to 200 μ M DHEA produced a similar but more rapid increase in the percentage of cells in G₁ and a decreased proportion of cells in S phase after 24 hours, which continued through the treatment.

This indicates that DHEA produced a G₁ block in HT-29 SF cells in a time- and dose-dependent manner.

Example 42: Reversal of DHEA-mediated Effect on Growth & Cell Cycle

Reversal of DHEA-mediated Growth Inhibition. Cells were plated as above, and after 2 days received either 0 or 25 μ M DHEA-containing medium supplemented with mevalonic acid ("MVA"; 2 mM) squalene ("SQ"; 80 μ M), cholesterol ("CH"; 15 μ g/ml), MVA plus CH, ribonucleosides ("RN"; uridine, cytidine, adenosine, and guanosine at final concentrations of 30 μ M each), deoxyribonucleosides ("DN"; thymidine, deoxycytidine, deoxyadenosine and deoxyguanosine at final concentrations of 20 μ M each). RN plus DN, or MVA plus CH plus RN, or medium that was not supplemented. All compounds were obtained from Sigma Chemical Co. (St. Louis, Mo.) Cholesterol was solubilized in ethanol immediately before use. RN and DN were used in maximal concentrations shown to have no effects on growth in the absence of DHEA.

Figure 3 illustrates the reversal of DHEA-induced growth inhibition in HT-29 SF cells. In A, the medium was supplemented with 2 μ M MVA, 80 μ M SQ, 15 μ g/ml CH, or MVA plus CH (MVA+CH) or was not supplemented (CON). In B, the medium was supplemented with a mixture of RN containing uridine, cytidine, adenosine, and guanosine in final concentrations of 30 μ M each; a mixture of DN containing thymidine, deoxycytidine, deoxyadenosine and deoxyguanosine in final concentrations of 20 μ M each; RN plus DN (RN+DN); or MVA plus CH plus RN (MVA+CH+RN). Cell numbers were assessed before and after 48 hours of treatment, and culture growth was calculated as the increase in cell number during the 48 hour treatment period. Columns represent cell growth percentage of untreated controls; bars represent SEM. Increase in cell number in untreated controls was $173,370 \pm 6518$. Each data point represents quadruplicate dishes from four independent experiments. Statistical analysis was performed using Student's t test; ψ $p < 0.01$; κ $p < 0.001$; compared to treated controls. Note that supplements had little effect on culture growth in absence of DHEA.

Under these conditions, the DHEA-induced growth inhibition was partially overcome by addition of MVA as well as by addition of MVA plus CH. Addition of SQ or CH alone had no such effect. This suggests that the cytostatic activity of DHEA was in part mediated by depletion of endogenous mevalonate and subsequent inhibition of the biosynthesis of an early intermediate in the cholesterol pathway that is essential for cell growth. Furthermore, partial reconstitution of growth was found after addition of RN as well as after addition of RN plus DN but not after addition of DN, indicating that depletion of both mevalonate and nucleotide pools is involved in the growth-inhibitory action of DHEA. However, none of the reconstitution conditions including the combined addition of

MVA, CH, and RN completely overcame the inhibitory action of DHEA, suggesting either cytotoxic effects or possibly that additional biochemical pathways are involved.

Example 43: Reversal of DHEA Effect on Cell Cycle

HT-29 SF cells were treated with 25 FM DHEA in combination with a number of compounds, including MVA, CH, or RN, to test their ability to prevent the cell cycle-specific effects of DHEA. Cell cycle distribution was determined after 48 and 72 hours using flow cytometry.

Figure 4 illustrates reversal of DHEA-induced arrest in HT-29 SF cells. Cells were plated (10^5 cells/60 mm dish) and 48 hours later treated with either 0 or 25 FM DHEA. The medium was supplemented with 2 FM MVA; 15 Fg/ml CH; a mixture of RN containing uridine, cytidine, adenosine, and guanosine in final concentrations of 30 FM; MVA plus CH (MVA+CH); or MVA plus CH plus RN (MVA+CH+RN) or was not supplemented. Cells were harvested after 48 or 72 hours, fixed in ethanol, and stained with propidium iodide, and the DNA content per cell was determined by flow cytometric analysis. The percentage of cells in G₁, S, and G₂M phases were calculated using the Cellfit cell cycle profile analysis program. S phase is marked by a quadrangle for clarity. Representative histograms from duplicative determinations are shown. The experiment was repeated two times. Note that supplements had little effect on cell cycle progression in the absence of DHEA.

With increasing exposure time, DHEA progressively reduced the proportion of cells in S phase. While inclusion of MVA partially prevented this effect in the initial 48 hours but not after 72 hours, the addition of MVA plus CH was also able to partially prevent S phase depletion at 72 hours, suggesting a requirement of both MVA and CH for cell progression during prolonged exposure. The addition of MVA, CH, and RN was apparently most effective at reconstitution but still did not restore the percentage of S phase cells to the value seen in untreated control cultures. CH or RN alone had very little effect at 48 hours and no effect at 72 hours. Morphologically, cells responded to DHEA by acquiring a rounded shape, which was prevented only by the addition of MVA to the culture medium (data not shown). Some of the DNA histograms after 72 hours DHEA exposure in FIG.4 also show the presence of a subpopulation of cells possessing apparently reduced DNA content. Since the HT-29 cell line is known to carry populations of cells containing varying numbers of chromosomes (68-72; ATCC), this may represent a subset of cells that have segregated carrying fewer chromosomes.

Example 44: Conclusions

The examples above provide evidence that in vitro exposure of HT-29 SF human colonic adenocarcinoma cells to concentrations of DHEA known to deplete endogenous mevalonate results in growth inhibition and G₁ arrest and that addition of MVA to the culture medium in part prevents these effects. DHEA produced effects upon protein isoprenylation which were in many respects similar to those observed for specific 3-hydroxy-3-methylglutaryl-CoA reductase inhibitors such as lovastatin and compactin. Unlike direct inhibitors of mevalonate biosynthesis, however, DHEA mediates its effects upon cell cycle progression and cell growth in a pleiotropic manner involving ribo- and deoxyribonucleotide biosynthesis and possibly other factors as well. The foregoing examples are illustrative of the present invention, but should not to be construed as limiting thereof. The invention is defined by the following claims, with equivalents of the claims to be included therein.

Example 45: Effect of CoQs & an EA on In Vitro NADPH Levels

Glucose-6-Phosphate Dehydrogenase (G6PD) is an important enzyme that is widespread in mammals, and is involved in the conversion of NADP to NADPH, thereby increasing NADPH levels. An inhibition of the G6PD enzyme, thus, will be expected to result in a reduction of cellular NADPH levels, which event, in turn, will be expected to inhibit pathways that are heavily dependent on NADPH. One such pathway, the so-called One-Carbon-Pool pathway, also known as the Folate Pathway, is directly involved in the production of adenosine by addition of the C₂ and C₈ carbon atoms of the purine ring. Consequently, the inhibition of this pathway will lead to adenosine depletion.

The present invention is broadly applicable to dehydroepiandrosterones (DHEAs) and Ubiquinones (CoQs). The description of the pathways involved in the present invention are described in the Background section. The present experiment was designed to show that one DHEA and two CoQs inhibit NADPH levels. DHEA, an dehydroepiandrosterone, has already been shown to decrease levels of adenosine in various tissues. See, Examples 1 and 2 above. The fact that two CoQs are shown to lower NADPH levels to a similar extent as a dehydroepiandrosterone, let alone to a similar extent ensures that the NADPH reduction caused by the CoQs will

also result in lower cellular adenosine levels or in adenosine cell depletion. Thus, in accordance with the invention, both dehydroepiandrosterones and Ubiquinones decrease levels of adenosine and, therefore, are useful as medicaments for use in the treatment of diseases where a decrease of adenosine levels or its depletion is desirable, including respiratory diseases such as asthma, bronchoconstriction, lung inflammation and allergies and the like.

- 5 Both Ubiquinones and DHEA inhibit NADPH levels in a statistically significant manner, when compared to a control. Moreover, the Ubiquinone inhibits NADPH levels to a similar extent as DHEA. The present invention is broadly applicable to the use of dehydroepiandrosterones (DHEAs) and Ubiquinones (CoQs) to the treatment of respiratory and lung diseases, and other diseases associated with varying levels of adenosine, adenosine hypersensitivity, asthma, bronchoconstriction, and/or lung inflammation and allergies. The DHEA and Ubiquinones
10 employed in the present experiments are equivalent to those described and exemplified above.

Enzymatic assay of purified G6PDH

The reaction mixture contained 50mM glycyl glycine buffer, pH 7.4, 2 mM D-glucose-6-phosphate, 0.67 mM Beta-NADP, 10 mM MgCL₂ and 0.0125 units of G6PDH in a final volume of 3.0 ml. All experiments were repeated 4 times.

- 15 The control group contained 3 samples that were added no DHEA or ubiquinone. The experimental group contained a similar number of samples (3) for each concentration of DHEA or ubiquinone. One group was added DHEA (in triplicate) at different concentrations. A second group was added different concentrations of a CoQ of long side chain (in triplicate), and a third group received a CoQ of short side chain (in triplicate), both at various doses in the μ M range.

- 20 The reaction was started by addition of the enzyme, and the increase in absorbance at 340 nm was measured for 5 minutes. Each data point was conducted in triplicate, and the full experiment was repeated 4 times.

- Both DHEA and the ubiquinones inhibited the enzyme activity in a statistically significant manner when compared to controls. DHEA was found to inhibit by 72% in vitro the activity of purified G6PDH when compared to control. Both ubiquinones inhibited the activity of purified G6PDH in vitro by an amount that was not
25 statistically significantly different from that of DHEA. Both DHEA and the ubiquinones inhibited the enzyme in a statistically significant manner when compared to controls. Both long chain and short chain CoQs were found to be effective inhibitors of G6PDH.

- The above results clearly indicate that CoQ reduced cellular levels of NADPH to an extent similar to DHEA and consequently cellular adenosine levels, and has a therapeutic effect on diseases and conditions
30 associated with them. The present results show that CoQs have a therapeutic effect similar to that of dehydroepiandrosterones. The pathways involved in the present invention, as described above, show the criticality of the results reported here, showing that a dehydroepiandrosterone (DHEA) and two ubiquinones inhibit NADPH levels in a statistically significant manner. The same dehydroepiandrosterone (DHEA) was shown in Examples 1 and 2 to decrease levels of adenosine in various tissues. The two different ubiquinones employed lowered NADPH
35 levels to a similar extent as DHEA. The NADPH reduction caused by the ubiquinones will, in the case of DHEA, result in lower cellular adenosine levels or adenosine depletion. Thus, in accordance with the invention, both dehydroepiandrosterones and ubiquinones decrease levels of adenosine and are, therefore, useful in the therapy of diseases and conditions where a decrease of adenosine levels or its depletion are desirable, including respiratory and airway diseases such as asthma, bronchoconstriction, lung inflammation and allergies, and the like.

- 40 In Examples 46 to 51, micronized anti-sense oligo targeting the adenosine A₁ receptor (EPI 2010) and micronized salmeterol (as the hydroxynaphthoate) are added in the proportions given below either dry or after predispersal in a small quantity of stabilizer, disodium dioctylsulphosuccinate, lecithin, oleic acid or sorbitan solvent to a suspension vessel containing the main bulk of the solvent. The resulting suspension is further dispersed by an appropriate mixing system using, for example, a high shear blender, ultrasonics or a microfluidiser until an ultrafine
45 dispersion is created. The suspension is then continuously recirculated to suitable filling equipment designed for cold fill or pressure filling of solvent. The suspension may be also prepared in a suitable chilled solution of stabilizer, in solvent.

Example 46: Metered Dose Inhaler

Active Ingredient	Target per Actuation
DHEA	200 mg

EPI 2010	1 mg
Stabilizer	5.0 µg
Solvent (1)	23.70 mg
Solvent (2)	61.25 mg

Example 47: Metered Dose Inhaler

Active Ingredient	Target per Actuation
DHEA-S	200 mg
EPI 2010	5 mg
Stabilizer	7.5 µg
Solvent (1)	23.67 mg
Solvent (2)	61.25 mg

Example 48: Metered Dose Inhaler

Active Ingredient	Target per Actuation
Ubiquinone (CoQ10)	200 mg
EPI 2010	30 mg
Stabilizer	25.0 µg
Solvent (1)	23.45 mg
Solvent (2)	61.25 mg

5

Example 49: Metered Dose Inhaler

Active Ingredient	Target per Actuation
DHEA	600 mg µg
EPI 2010	1.0 mg
Stabilizer	15.0 µg
Solvent (1)	23.56 mg
Solvent (2)	61.25 mg

Example 50: Metered Dose Inhaler

Active Ingredient	Target per Actuation
DHEA-S	600 mg
EPI 2010	5.0 mg
Stabilizer	15.0 µg
Solvent (1)	23.56 mg
Solvent (2)	61.25 mg

10 **Example 51: Metered Dose Inhaler**

Active Ingredient	Target per Actuation
Ubiquinone	600 mg
EPI 2010	30.0 mg
Stabilizer	25.0 µg
Solvent (1)	23.43 mg
Solvent (2)	61.25 mg

In the following Examples 43 to 48, the active ingredients are micronized and bulk blended with lactose in the proportions given above. The blend is filled into hard gelatin capsules or cartridges or into specifically constructed double foil blister packs (Rotadisks blister packs, Glaxo® to be administered by an inhaler such as the Rotahaler inhaler (Glaxo®) or in the case of the blister packs with the Diskhaler inhaler (Glaxo®).

15

Example 52: Metered Dose Dry Powder Formulation

Active Ingredient	/cartridge or blister
DHEA	1 mg
EPI 2010	0.05 mg
Lactose Ph. Eur.	to 12.5 or 25.0 mg

Example 53: Metered Dose Dry Powder Formulation

Active Ingredient	/cartridge or blister
DHEA-S	1 mg
EPI 2010	0.1 mg
Lactose Ph. Eur.	to 12.5 or 25.0 mg

Example 54: Metered Dose Dry Powder Formulation

Active Ingredient	/cartridge or blister
Ubiquinone	1 mg
EPI 2010	0.15 mg
Lactose Ph. Eur.	to 12.5 or 25.0 mg

Example 55: Metered Dose Dry Powder Formulation

Active Ingredient	/cartridge or blister
DHEA	1 mg
EPI 2010	0.01 mg
Lactose Ph. Eur.	to 12.5 or 25.0 mg

Example 56: Metered Dose Dry Powder Formulation

Active Ingredient	/cartridge or blister
DHEA-S	1 mg
EPI 2010	0.05 mg
Lactose Ph. Eur.	to 12.5 or 25.0 mg

Example 57: Metered Dose Dry Powder Formulation

Active Ingredient	/cartridge or blister
Ubiquinone	1 mg
EPI 2010	0.1 mg
Lactose Ph. Eur.	to 12.5 or 25.0 mg

Example 58: Metered Dose Inhaler Formulation (1)

- Standard 12.5 ml MDI (metered dose inhaler) cans (Presspart Inc., Cary N.C.) are spray-coated with PTFE-FEP-polyamideimide blend (DuPont) and cured according to the vendor's standard procedure. The thickness of the coating is between approximately 1 μ m and approximately 20 μ m. These cans are then purged of air the valves crimped in place, and a suspension of about 68 mg of micronised beclomethasone dipropionate monohydrate and 1 mg of oligonucleotide in about 6.1 mg water and about 18.2 g P134a is filled through the valve.

Example 59: Metered Dose Inhaler Formulation (2)

- Standard 12.5 ml MDI cans (Presspart Inc., Cary N.C.) are spray-coated with PTFE-FEP-polyamideimide blend (DuPont) and cured according to the vendor's standard procedure. The thickness of the coating is between approximately 1 μ m and approximately 20 μ m. These cans are then purged of air the valves crimped in place, and about 50 mg of dehydroepiandrosterone, 1 mg of micronised oligonucleotide and 50 mg of Coenzyme Q10 in about 182 mg ethanol and about 18.2 g P134a is filled through the valve.

Example 60: Metered Dose Inhaler Formulation (3)

Standard 12.5 ml MDI cans (Presspart Inc., Cary N.C.) are spray-coated with PTFE-PES blend (DuPont) as a single coat and cured according to the vendor's standard procedure. The thickness of the coating is between approximately 1 μm and approximately 20 μm . These cans are then purged of air, the valves crimped in place, and a suspension of about 41.0 mg, 21.0 mg, 8.8 mg or 4.4 mg of micronised fluticasone propionate and 2 mg of micronised oligonucleotide in about 12 g P134a is filled through the valve.

Example 61: Metered Dose Inhaler Formulation (4)

Standard 12.5 ml MDI cans (Presspart Inc., Cary N.C.) are spray-coated with PTFE-PES blend (DuPont) as a single coat and cured according to the vendor's standard procedure. The thickness of the coating is between approximately 1 μm and approximately 20 μm . These cans are then purged of air, the valves crimped in place, and a suspension of about 8.8 mg, 22 mg or 44 mg of micronised fluticasone propionate with about 6.4 mg of micronised salmeterol xinafoate and 1 mg of micronised oligonucleotide in about 12 g P134a is filled through the valve.

Example 62: Metered Dose Inhaler Formulation (5)

Standard 12.5 ml MDI cans (Presspart Inc., Cary N.C.) are spray-coated with PTFE-FEP-polyamideimide blend (DuPont) and cured according to the vendor's standard procedure. The thickness of the coating is between approximately 1 μm and approximately 20 μm . These cans are then purged of air the valves crimped in place, and a suspension of about 50mg of micronised dehydroepiandrosterone with about 6.4 mg of micronised salmeterol xinafoate and 2 mg of micronised oligonucleotide in about 12 g P134a is filled through the valve.

Example 63: Metered Dose Inhaler Formulation (6)

Standard 12.5 ml MDI cans (Presspart Inc., Cary N.C.) are spray-coated with PTFE-PES blend (DuPont) as a single coat and cured according to the vendor's standard procedure. The thickness of the coating is between approximately 1 μm and approximately 20 μm . These cans are then purged of air, the valves crimped in place, and a suspension of about 50 mg of micronised dehydroepiandrosterone sulfate and 2 mg of micronised oligonucleotide in about 12 g P134a is filled through the valve.

Example 64: Effect of CoQs & an EA on In Vitro NADPH Levels

Glucose-6-Phosphate Dehydrogenase (G6PD) is an important enzyme that is widespread in mammals, and is involved in the conversion of NADP to NADPH, thereby increasing NADPH levels. An inhibition of the G6PD enzyme, thus, will be expected to result in a reduction of cellular NADPH levels, which event, in turn, will be expected to inhibit pathways that are heavily dependent on NADPH. One such pathway, the so-called One-Carbon-Pool pathway, also known as the Folate Pathway, is directly involved in the production of adenosine by addition of the C₂ and C₈ carbon atoms of the purine ring. Consequently, the inhibition of this pathway will lead to adenosine depletion.

The present invention is broadly applicable to Epiandrosterones (EAs) and Ubiquinones (CoQs). The description of the pathways involved in the present invention are described in the Background section. The present experiment was designed to show that one EA and two CoQs inhibit NADPH levels. DHEA, an Epiandrosterone, has already been shown to decrease levels of adenosine in various tissues. See, Examples 1 and 2 above. The fact that two CoQs are shown to lower NADPH levels to a similar extent as an Epiandrosterone, let alone to a similar extent ensures that the NADPH reduction caused by the CoQs will also result in lower cellular adenosine levels or in adenosine cell depletion. Thus, in accordance with the invention, both Epiandrosterones and Ubiquinones decrease levels of adenosine and, therefore, are useful as medicaments for use in the treatment of diseases where a decrease of adenosine levels or its depletion is desirable, including respiratory diseases such as asthma, bronchoconstriction, lung inflammation and allergies and the like. Both Ubiquinones and DHEA inhibit NADPH levels in a statistically significant manner, when compared to a control. Moreover, the Ubiquinone inhibits NADPH levels to a similar extent as DHEA. The present invention is broadly applicable to the use of Epiandrosterones (EAs) and Ubiquinones (CoQs) to the treatment of respiratory and lung diseases, and other diseases associated with varying levels of adenosine, adenosine hypersensitivity, asthma, bronchoconstriction, and/or lung inflammation and allergies. The

DHEA and Ubiquinones employed in the present experiments are equivalent to those described and exemplified above.

Enzymatic assay of purified G6PDH

5 The reaction mixture contained 50mM glycyl glycine buffer, pH 7.4, 2 mM D-glucose-6-phosphate, 0.67 mM Beta-NADP, 10 mM MgCL2 and 0.0125 units of G6PDH in a final volume of 3.0 ml. All experiments were repeated 4 times.

10 The control group contained 3 samples that were added no DHEA or Ubiquinone. The experimental group contained a similar number of samples (3) for each concentration of DHEA or Ubiquinone. One group was added DHEA (in triplicate) at different concentrations. A second group was added different concentrations of a CoQ of long side chain (in triplicate), and a third group received a CoQ of short side chain (in triplicate), both at various doses in the μ M range.

The reaction was started by addition of the enzyme, and the increase in absorbance at 340 nm was measured for 5 minutes. Each data point was conducted in triplicate, and the full experiment was repeated 4 times.

15 Both DHEA and the Ubiquinones inhibited the enzyme activity in a statistically significant manner when compared to controls. DHEA was found to inhibit by 72% in vitro the activity of purified G6PDH when compared to control. Both Ubiquinones inhibited the activity of purified G6PDH in vitro by an amount that was not statistically significantly different from that of DHEA. Both DHEA and the Ubiquinones inhibited the enzyme in a statistically significant manner when compared to controls. Both long chain and short chain CoQs were found to be effective inhibitors of G6PDH.

20 The above results clearly indicate that CoQ reduced cellular levels of NADPH to an extent similar to DHEA and consequently cellular adenosine levels, and has a therapeutic effect on diseases and conditions associated with them. The present results show that CoQs have a therapeutic effect similar to that of epiandrosterones. The pathways involved in the present invention, as described above, show the criticality of the results reported here, showing that an Epiandrosterone (DHEA) and two Ubiquinones inhibit NADPH levels in a statistically significant manner. The same epiandrosterone (DHEA) was shown in Examples 1 and 2 to decrease levels of adenosine in various tissues. The two different Ubiquinones employed lowered NADPH levels to a similar extent as DHEA. The NADPH reduction caused by the Ubiquinones will, in the case of DHEA, result in lower cellular adenosine levels or adenosine depletion. Thus, in accordance with the invention, both Epiandrosterones and Ubiquinones decrease levels of adenosine and are, therefore, useful in the therapy of diseases and conditions where
30 a decrease of adenosine levels or its depletion are desirable, including respiratory and airway diseases such as asthma, bronchoconstriction, lung inflammation and allergies, and the like.

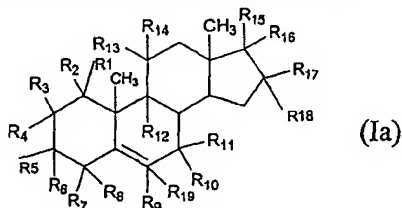
These are clearly superior results, which could not have been expected based on the knowledge of the art at the time of this invention. The experimental data and results provided are clearly enabling of the effect of ubiquinones on adenosine cellular levels and, therefore, on its therapeutic affect on diseases and conditions
35 associated with them, as described and claimed in this patent.

The foregoing examples are illustrative of the present invention, and are not to be construed as limiting thereof. The invention is defined by the following claims, with equivalents of the claims to be included therein.

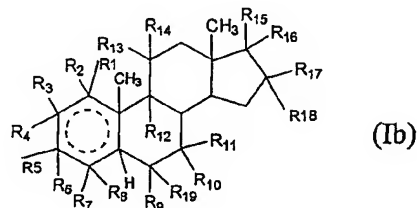
WHAT IS CLAIMED AS NOVEL & UNOBVIOUS**IN UNITED STATES LETTERS PATENT IS:**

1. A pharmaceutical composition, comprising a pharmaceutically or veterinarily acceptable carrier or diluent, and prophylactic or therapeutic amounts of a first and second active agents;

the first active agent comprising an oligonucleotide(s) (oligo(s)) that is anti-sense to the initiation codon, the coding region, the 5'-end or the 3'-end genomic flanking regions, the 5' and 3' intron-exon junctions, or regions within 2 to 10 nucleotides of the junctions of one or more gene(s) encoding or to regulatory sequence(s) associated with one or more target polypeptide(s) associated with lung and/or nasal airway dysfunction, or anti-sense to the corresponding mRNA; or combinations or mixtures of the oligo(s); and the second active agent comprising an anti-inflammatory steroid (AIS) of chemical formula



OR

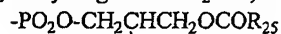


wherein R₁, R₂, R₃, R₄, R₆, R₇, R₈, R₉, R₁₀, R₁₂, R₁₃, R₁₄ and R₁₉ are independently H, OR, halogen, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene, (C₁-C₁₀) alkyne, (C₁-C₁₀) alkoxy, or two or more of R₁, R₂, R₃, R₄, R₆, R₇, R₈, R₉, R₁₀, R₁₂, R₁₃, R₁₄ and R₁₉ can be linked by combination of the atoms of C, O, N, S, P and Si to form a 3 to 15 member ring(s), in the α- and/or β- configuration;

R₅, R₆, R₁₀, and R₁₁ are independently OH, SH, H, halogen, pharmaceutically acceptable ester, pharmaceutically acceptable thioester, pharmaceutically acceptable ether, pharmaceutically acceptable thioether, pharmaceutically acceptable inorganic esters, pharmaceutically acceptable monosaccharide, disaccharide or oligosaccharide, spirooxirane, spirothirane, -OSO₂R₂₀, -OPOR₂₀R₂₁, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene, (C₁-C₁₀) alkyne or OR₂₃,

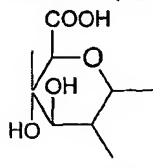
$$\begin{array}{c} \text{-SO}_2\text{O-CH}_2\text{CHCH}_2\text{OCOR}_{25} \\ | \\ \text{OCOR}_{24} \end{array}$$

wherein, R₂₃ is hydrogen or SO₂OM, wherein M is selected from H, Na, sulfatide;



phosphatide

, wherein R₂₄ and R₂₅, which may be the same or different, are straight or branched (C₁-C₂₀) alkyl, (C₁-C₂₀) alkene, (C₁-C₂₀) alkyne, sugar, polyethyleneglycol (PEG) or glucuronide



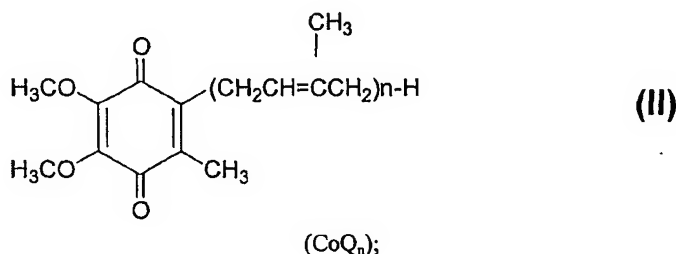
R₅ and R₆ taken together are =O;

R₁₀ and R₁₁ taken together are =O;

R₁₅ is (1) H, halogen, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene, (C₁-C₁₀) alkyne, or (C₁-C₁₀) alkoxy when R₁₆ is -C(O)OR₂₂, (2) H, halogen, OH, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene or (C₁-C₁₀) alkyne, when R₁₆ is halogen, OH, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkene or (C₁-C₁₀) alkyne, (3) H, halogen, (C₁-C₁₀) alkyl, (C₁-C₁₀) alkenyl, (C₁-C₁₀) alkynyl, formyl, (C₁-C₁₀) alkanoyl or epoxy when R₁₆ is OH, (4) OR, SR, SH, H, halogen, pharmaceutically acceptable ester, pharmaceutically acceptable thioester, pharmaceutically acceptable ether, pharmaceutically acceptable thioether, pharmaceutically acceptable inorganic esters, pharmaceutically acceptable monosaccharide, disaccharide or oligosaccharide, spirooxirane, spirothirane, -OSO₂R₂₀ or -OPOR₂₀R₂₁ when R₁₆ is H, or R₁₅ and R₁₆ taken together are =O;

R_{17} and R_{18} are independently (1) H, -OH, halogen, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkene, (C_1-C_{10}) alkyne or $-(C_1-C_{10})$ alkoxy when R_6 is H OR, halogen, (C_1-C_{10}) alkyl or $-C(O)OR_{22}$, (2) H, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkene, (C_1-C_{10}) alkyne, (C_1-C_{10}) alkoxy, $((C_1-C_{10})$ alkyl) $_n$ amino, $((C_1-C_{10})$ alkene) $_n$ amino, $((C_1-C_{10})$ alkyne) $_n$ amino, $((C_1-C_{10})$ alkoxy) $_n$ amino, $((C_1-C_{10})$ alkyl) $_n$ amino- (C_1-C_{10}) alkyl, $((C_1-C_{10})$ alkene) $_n$ amino- (C_1-C_{10}) alkyl, $((C_1-C_{10})$ alkyne) $_n$ amino- (C_1-C_{10}) alkyl, $((C_1-C_{10})$ alkoxy) $_n$ amino- (C_1-C_{10}) alkyl, $((C_1-C_{10})$ alkyl) $_n$ amino- (C_1-C_{10}) alkene, $((C_1-C_{10})$ alkene) $_n$ amino- (C_1-C_{10}) alkene, $((C_1-C_{10})$ alkyne) $_n$ amino- (C_1-C_{10}) alkene, $((C_1-C_{10})$ alkoxy) $_n$ amino- (C_1-C_{10}) alkyne, $((C_1-C_{10})$ alkene) $_n$ amino- (C_1-C_{10}) alkyne, $((C_1-C_{10})$ alkyne) $_n$ amino- (C_1-C_{10}) alkyne, (C_1-C_{10}) alkoxy, hydroxy - (C_1-C_{10}) alkyl, hydroxy - (C_1-C_{10}) alkene, hydroxy - (C_1-C_{10}) alkyne, (C_1-C_{10}) alkoxy - (C_1-C_{10}) alkyl, (C_1-C_{10}) alkoxy - (C_1-C_{10}) alkene, (C_1-C_{10}) alkoxy - (C_1-C_{10}) alkyne, (halogen) $_m$ (C_1-C_{10}) alkyl, (halogen) $_m$ (C_1-C_{10}) alkene, (halogen) $_m$ (C_1-C_{10}) alkyne, (C_1-C_{10}) alkanoyl, formyl, (C_1-C_{10}) carbalkoxy or (C_1-C_{10}) alkanoyloxy when R_{15} and R_{16} taken together are =O, (3) R_{17} and R_{18} taken together are =O; (4) R_{17} and R_{18} taken together with the carbon to which they are attached form a 3-6 member ring containing 0 or 1 oxygen atom; or (5) R_{15} and R_{17} taken together with the carbons to which they are attached form an epoxide ring; R_{20} and R_{21} are independently OH, pharmaceutically acceptable ester or pharmaceutically acceptable ether; R_{22} is H, (halogen) $_m$ (C_1-C_{10}) alkyl, (halogen) $_m$ (C_1-C_{10}) alkene, (halogen) $_m$ (C_1-C_{10}) alkyne, (C_1-C_{10}) alkyl, (C_1-C_{10}) alkene or (C_1-C_{10}) alkyne; n is 0, 1 or 2; and m is 1, 2 or 3, ; or pharmaceutically or veterinarily acceptable salts thereof; and/or

a ubiquinone of the chemical formula



wherein n=1 to 12, or pharmaceutically or veterinarily acceptable salts thereof; the first and second agents being present in amounts effective for reducing or depleting levels of, or reducing sensitivity to, adenosine, reducing levels of adenosine receptors, producing bronchodilation, increasing levels of ubiquinone or lung surfactant in a subject's tissue (s), or treating bronchoconstriction, lung inflammation or lung allergies or a respiratory or lung disease or condition.

2. The composition of claim 1, wherein the oligo contains up to about 15% A.

3. The composition of claim 1, wherein the oligo(s) of the first active agent is (are) anti-sense to the initiation codon, the coding region, the 5'-end or the 3'-end genomic flanking regions, the 5' or 3' intron-exon junctions, and regions within 2 to 10 nucleotides of the junctions of at least one oncogene(s) or a gene(s) encoding, or regulating expression of, a target polypeptide(s) associated with lung and/or nasal airway dysfunction or cancer, is (are) anti-sense to the corresponding mRNA(s). Multiple target anti-sense oligo(s) (MTAs) or combinations thereof; the polypeptides comprising peptide factors and transmitters, antibodies, cytokines or chemokines, enzymes, binding proteins, adhesion molecules, their receptors, or malignancy associated proteins.

4. The composition of claim 3, wherein the oligo(s) is (are) anti-sense to the initiation codon, the coding region, the 5'-end or the 3'-end genomic flanking regions, the 5' or 3' intron-exon junctions, or regions within 2 to 10 nucleotides of the junctions of at least one oncogene(s) or a gene(s) encoding, or regulating expression of, a target polypeptide(s) associated with lung and/or nasal airway dysfunction or is (are) anti-sense to the oncogene mRNA, or the corresponding mRNA; or MTAs or combinations thereof; wherein the polypeptides comprise of transcription factors, stimulating or activating peptide factors, cytokines, cytokine receptors, chemokines, chemokine receptors, adenosine receptors, bradykinin receptors, endogenously produced specific or non-specific enzymes, immunoglobulins or antibodies, antibody receptors, central nervous system (CNS) or peripheral nervous or non-nervous system receptors, CNS or peripheral nervous or non-nervous system peptide transmitters, adhesion molecules, defensins, growth factors, vasoactive peptides and receptors, binding proteins, or malignancy associated proteins.

5. The composition of claim 4, wherein the encoded polypeptide(s) comprise(s) one or more adenosine receptors A₁, A_{2a}, A_{2b} or A₃, bradykinin receptors B1 or B2, NfκB Transcription Factor, Interleukin-8

Receptor (IL-8 R), Interleukin 5 Receptor (IL-5 R), Interleukin 4 Receptor (IL-4 R), Interleukin 3 Receptor (IL-3 R), Interleukin-1 β (IL-1 β), Interleukin 1 β Receptor (IL-1 β R), Eotaxin, Tryptase, Major Basic Protein, β 2-adrenergic Receptor Kinase, Endothelin Receptor A, Endothelin Receptor B, Preproendothelin, Bradykinin B2 Receptor, IgE High Affinity Receptor, Interleukin 1 (IL-1), Interleukin 1 Receptor (IL-1 R), Interleukin 9 (IL-9), Interleukin-9 Receptor (IL-9 R), Interleukin 11 (IL-11), Interleukin-11 Receptor (IL-11 R), Inducible Nitric Oxide Synthase, Cyclo-oxygenase-1 (COX-1), Cyclo-oxygenase-2 (COX-2), Intracellular Adhesion Molecule 1 (ICAM-1) Vascular Cellular Adhesion Molecule (VCAM), Rantes, Endothelial Leukocyte Adhesion Molecule (ELAM-1), Monocyte Activating Factor, Neutrophil Chemotactic Factor, Neutrophil Elastase, Defensin 1, 2 and 3, Muscarinic Acetylcholine Receptors, Platelet Activating Factor, Tumor Necrosis Factor α , 5-lipoxygenase, Phosphodiesterase IV, Substance P, Substance P Receptor, Histamine Receptor, Chymase, CCR-1 CC Chemokine Receptor, CCR-2 CC Chemokine Receptor, CCR-3 CC Chemokine Receptor, CCR-4 CC Chemokine Receptor, CCR-5 CC Chemokine Receptor, Prostanoid Receptors, GATA-3 Transcription Factor, Neutrophil Adherence Receptor, MAP Kinase, Interleukin-9 (IL-9), NFAT Transcription Factors, STAT 4, MIP-1 α , MCP-2, MCP-3, MCP-4, Cyclophilins, Phospholipase A2, Basic Fibroblast Growth Factor, Metalloproteinase, CSBP/p38 MAP Kinase, Tryptase Receptor, PDG2, Interleukin-3 (IL-3), Interleukin-1 β (IL-1 β), Cyclosporin A-Binding Protein, FK5-Binding Protein, α 4 β 1 Selectin, Fibronectin, α 4 β 7 Selectin, Mad CAM-1, LFA-1 (CD11a/CD18), PECAM-1, LFA-1 Selectin, C3bi, PSGL-1, E-Selectin, P-Selectin, CD-34, L-Selectin, p150,95, Mac-1 (CD11b/CD18), Fucosyl transferase, VLA-4, CD-18/CD11a, CD11b/CD18, ICAM2 and ICAM3, C5a, CCR3 (Eotaxin Receptor), CCR1, CCR2, CCR4, CCR5, LTB-4, AP-1 Transcription Factor, Protein kinase C, Cysteinyl Leukotriene Receptor, Tachychininen Receptors (tach R), IkB Kinase 1 & 2, STAT 6, c-mas or NF-Interleukin-6 (NF-IL-6).

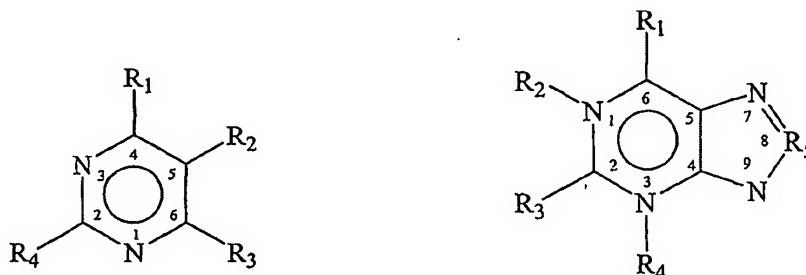
6. The composition of claim 4, wherein the encoded polypeptide(s) comprise(s) a H2A histone family member N, Tubulin, beta polypeptide, ELL gene (11-19 lysine-rich leukemia gene); 7-dehydrocholesterol reductase, ADP-ribosylation factor-like 7, Karyopherin alpha 2 (RAG cohort 1, importin alpha 1), EST (AI038433), EST (AI122689), EST (AI092623), ESTs (AI095492), ESTs (AI138216), ESTs (AI128305), ESTs (AI125228), ESTs (AI041482), ESTs (AI051839), Homo sapiens mRNA; cDNA DKFZp434A1716, ESTs (AI096522), ESTs (AI122807), ESTs (AI041212), EST (AI125651), Enolase 1, (alpha), EST (AI024215), EST (AI034360), Homo sapiens mRNA; cDNA DKFZp564H0764, Homo sapiens mRNA for KIAA1363 protein, partial cds, Potassium voltage-gated channel, shaker-related subfamily, beta member 2, ER-associated DNAJ; ER-associated Hsp40 co-chaperone; hDj9; ERj3, ESTs, Weakly similar to p38 protein [H.sapiens] (AA906703), CGI-142, ESTs (AA463249), Homo sapiens clone 25058 mRNA sequence ESTs (R49144), Squamous cell carcinoma antigen 1, ESTs (AA425700), Myosin X, ESTs (AA459692), Epithelial protein lost in neoplasm beta, CD44 antigen (homing function and Indian blood group system), Coagulation factor III (thromboplastin, tissue factor), ESTs (AA909635), Adducin 1 (alpha), 5' Nucleotidase (CD73), ESTs, moderately similar to semaphorin C [M.musculus] (AA293300), ESTs (AA278764), ESTs (AA678160), Calmodulin 2 (phosphorylase kinase, delta), ESTs (R42770), Chloride intracellular channel 1, High-mobility group (nonhistone chromosomal) protein 17, Ubiquitin carrier protein, Tubulin, alpha 1 (testis specific), Transglutaminase 2 (C polypeptide, protein-glutamine-gamma-glutamyltransferase), Sparc/osteonectin, cwcv and kazal-like domains proteoglycan (testican), Proteasome (prosome, macropain) 26S subunit, non-ATPase, 2, Tubulin, beta polypeptide, Filamin B, beta (actin-binding protein-278), Stanniocalcin, Low density lipoprotein receptor (familial hypercholesterolemia), Plectin 1, intermediate filament binding protein, 500kD, S100 calcium-binding protein A2, Immediate early response 3, Calpain, large polypeptide L2, Pleckstrin homology-like domain, family A, member 1, Melanoma adhesion molecule, CD44 antigen (homing function and Indian blood group system), Programmed cell death 5, Hexokinase 1, Vascular endothelial growth factor, Integrin, alpha 2 (CD49B, alpha 2 subunit of VLA-2 receptor), Calumenin, Syntaxin 11, Diphtheria toxin receptor (heparin-binding epidermal growth factor-like growth factor), Fn14 for type I transmembrane protein, Nef-associated factor 1, High-mobility group (nonhistone chromosomal) protein isoforms I and Y, Catechol-O-methyltransferase, C-terminal binding protein 1, Collagen, type XVII, alpha 1, ESTs (N58473), Farnesyl-diphosphate farnesyltransferase 1 RNA helicase-related protein, Interferon stimulated gene (20kD), Steroid-5-alpha-reductase, alpha polypeptide 1 (3-oxo-5 alpha-steroid delta 4-dehydrogenase alpha 1), Prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase), Laminin, alpha 3 (nicein (150kD), kalinin (165kD), BM600 (150kD), epilegrin), Collagen, type XVII, alpha 1, Keratin 18, Heparan sulfate (glucosamine) 3-O-sulfotransferase 1, Tubulin, alpha 2, Adenylyl cyclase-associated protein, Forkhead box D1, Cathepsin C, ESTs, Highly similar to AF151802_1 CGI-44 protein [H.sapiens] (T74688), Ribonucleotide reductase

M2 polypeptide, Laminin, gamma 2 (nicein (100kD), kalinin (105kD), BM600 (100kD), Herlitz junctional epidermolysis bullosa)), Homo sapiens mRNA; cDNA DKFZp586P1622 (from clone DKFZp586P1622), ESTs, Weakly similar to /prediction (AA284245), or Lactate dehydrogenase A.

7. The composition of claim 1, wherein one or more As of the first active agent is(are) substituted by a universal base comprising a heteroaromatic base that binds to thymidine or uridine but has antagonist activity or less than about 0.3 of the adenosine agonist or antagonist activity at the adenosine A₁, A_{2a}, A_{2b} or A₃ receptors.

8. The composition of claim 7, wherein the heteroaromatic base(s) comprise(s) pyrimidines or purines, which may be substituted by O, halo, NH₂, SH, SO, SO₂, SO₃, COOH, branched or fused primary or secondary amino, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, alkoxy, alkenoxy, acyl, cycloacyl, arylacyl, alkynoxy, cycloalkoxy, aroyl, arylthio, arylsulfoxyl, halocycloalkyl, alkylcycloalkyl, alkenylcycloalkyl, alkynylcycloalkyl, haloaryl, alkylaryl, alkenylaryl, alkynylaryl, arylalkyl, arylalkenyl, arylalkynyl, arylcycloalkyl, all of which may be further substituted by O, halo, NH₂, primary, secondary or tertiary amine, SH, SO, SO₂, SO₃, cycloalkyl, heterocycloalkyl or heteroaryl.

9. The composition of claim 7, wherein the purines are substituted at positions 1, 2, 3, 6, and/or 8, the pyrimidines are substituted at positions 2, 3, 4, 5 and/or 6, and the purines and pyrimidines have the chemical formula



pyrimidines

or

purines

wherein R¹, R², R³, R⁴ and R⁵ are independently H, alkyl, alkenyl or alkynyl and R³ is H, aryl, dicycloalkyl, dicycloalkenyl, dicycloalkynyl, cycloalkyl, cycloalkenyl, cycloalkynyl, O-cycloalkyl, O-cycloalkenyl, O-cycloalkynyl, NH₂-alkylamino-ketoxyalkoxy-aryl, or mono or dialkylaminoalkyl-N-alkylamino-SO₂aryl, and R₄ and R₅ are independently R₁ and together are R₃, and the pyrimidines and purines optionally comprise theophylline, caffeine, dyphylline, etophylline, acephylline piperazine, bamifylline, enprofylline or xanthine.

10. The composition of claim 9, wherein the universal base of the first active agent comprises 3-nitropyrrole-2'-deoxynucleoside, 5-nitro-indole, 2-deoxyribosyl-(5-nitroindole), 2-deoxyribofuranosyl-(5-nitroindole), 2'-deoxyinosine, 2'-deoxynebularine, 6H, 8H-3,4-dihydropyrimido [4,5-c] oxazine-7-one or 2-amino-6-methoxyaminopurine.

11. The composition of claim 1, wherein if present in the first active agent(s), one or more methylated cytosine(s) (^mC) is(are) substituted for a C in or to form one or more CpG dinucleotide(s).

12. The composition of claim 1, wherein one or more mononucleotide(s) of the first active agent(s) is(are) linked or modified by one or more of methylphosphonate, 5'-N-carbamate, phosphotriester, phosphorothioate, phosphorodithioate, boranophosphate, formacetal, thioformacetal, thioether, carbonate, carbamate, sulfate, sulfonate, sulfamate, sulfonamide, sulfone, sulfite, sulfoxide, sulfide, hydroxylamine, methylene(methylimino) (MMI), methoxymethyl (MOM), methoxyethyl (MOE), methyleneoxy (methylimino) (MOMI), 2'-O-methyl, phosphoramidate, or C-5 substituted residues.

13. The composition of claim 12, wherein one or more mononucleotide residue(s) of the first active agent(s) are linked by phosphorothioate residues.

14. The composition of claim 1, wherein the anti-sense oligo of the first active agent(s) comprise(s) about 7 to about 60 mononucleotides.

15. The composition of claim 1, wherein the anti-sense oligo of the first active agent(s) comprise(s) fragments 1, 3, 5, 7 and 8 to 2498 (SEQ ID NOS: 1 through 2498).

16. The composition of claim 1, wherein the anti-sense oligo of the first active agent(s) is(are) operatively linked to, or complexed with, a cell internalized or up-taken agent(s) or a cell targeting agent(s).

17. The composition of claim 15, wherein the cell internalized or up-taken agent comprises transferrin, asialoglycoprotein or streptavidin, and the cell targeting agent comprises a prokaryotic or eukaryotic vector or plasmid.

18. The composition of claim 1, wherein the oligo contains up to about 10% A.

19. The composition of claim 1, wherein the oligo(s) of the first active agent(s) is(are) hybridized to a ribonucleic acid or a deoxyribonucleic acid and delivered as a double stranded agent.

20. The composition of claim 1, wherein the carrier or diluent comprises a gaseous, liquid, or solid carrier or diluent, and the active agents are present in an amount of about 0.01 to about 99.99 w/w of the composition.

21. The composition of claim 20, further comprising an agent selected from other therapeutic agents, surfactants, flavoring or coloring agents, fillers, volatile oils, buffering agents, dispersants, RNA inactivating agents, anti-oxidants, flavoring agents, propellants or preservatives.

22. The composition of claim 21, wherein the other therapeutic or bioactive agent(s) is (are) selected from analgesics, pre-menstrual medications, menopausal agents, anti-aging agents, anti-anxiolytic agents, mood disorder agents, anti-depressants, anti-bipolar mood agents, anti-schizophrenic agents, anti-cancer agents, alkaloids, blood pressure controlling agents, muscle relaxants, steroids, soporific agents, anti-ischemic agents, anti-arrhythmic agents, contraceptives, vitamins, minerals, tranquilizers, neurotransmitter regulating agents, wound healing agents, anti-angiogenic agents, cytokines, growth factors, B-adrenergic receptor agonists, anti-metastatic agents, antacids, anti-histaminic agents, anti-bacterial agents, anti-viral agents, anti-gas agents, appetite suppressants, sun screens, emollients, skin temperature lowering products, radioactive phosphorescent or fluorescent contrast diagnostic or imaging agents, libido altering agents, bile acids, laxatives, anti-diarrheic agents, skin renewal agents, hair growth agents, analgesics, pre-menstrual medications, anti-menopausal agents, hormones, anti-aging agents, anti-anxiolytic agents, nociceptive agents, mood disorder agents, anti-depressants, anti-bipolar mood agents, anti-schizophrenic agents, anti-cancer agents, alkaloids, blood pressure controlling agents, other hormones, other anti-inflammatory agents, agents for treating arthritis, burns, wounds, chronic bronchitis, chronic obstructive pulmonary disease (COPD), inflammatory bowel disease such as Crohn's disease, ulcerative colitis, autoimmune disease, or lupus erythematosus, muscle relaxants, soporific agents, anti-ischemic agents, anti-arrhythmic agents, contraceptives, vitamins, minerals, tranquilizers, neurotransmitter regulating agents, wound and burn healing agents, anti-angiogenic agents, cytokines, growth factors, anti-metastatic agents, antacids, anti-histaminic agents, anti-bacterial agents, anti-viral agents, anti-gas agents, agents for reperfusion injury, counteracting appetite suppressants, sun screens, emollients, skin temperature lowering products, radioactive phosphorescent or fluorescent contrast diagnostic or imaging agents, libido altering agents, bile acids, laxatives, anti-diarrheic agents, skin renewal agents or hair growth agents.

23. The composition of claim 22, wherein the surfactant comprises surfactant protein A, surfactant protein B, surfactant protein C, surfactant protein D and surfactant Protein E, di-saturated phosphatidyl choline (other than dipalmitoyl), dipalmitoyl phosphatidyl choline, phosphatidyl choline, phosphatidyl glycerol, phosphatidyl inositol, phosphatidyl ethanolamine, phosphatidyl serine; phosphatidic acid, ubiquinones, lysophosphatidyl ethanolamine, lysophosphatidyl choline, palmitoyl- lysophosphatidyl choline, dehydroepiandrosterone, dolichols, sulfatidic acid, glycerol-3-phosphate, dihydroxyacetone phosphate, glycerol, glycerol-3-phosphocholine, dihydroxy acetone, palmitate, cytidine diphosphate (CDP) diacyl glycerol, CDP choline, choline, choline phosphate; natural or artificial lamellar bodies as carrier surfactant vehicles, omega-3 fatty acids, polyenic acid, polyenoic acid, lecithin, palmitic acid, non-ionic block copolymers of ethylene or propylene oxides, polyoxypropylene, monomeric or polymeric, polyoxyethylene, monomeric and polymeric, poly (vinyl amine) with dextran and/or alkanoyl side chains, Brij 35, Triton X-100 or synthetic surfactants ALEC, Exosurf, Survan or Atovaquone.

24. The composition of claim 1, comprising one or more oligo(s), an anti-inflammatory steroid(s) of formula (Ia) or (Ib), a steroid, a surfactant, and a carrier or diluent for the oligo.

25. The composition of claim 1, wherein the second active agent comprises CoQ_n , wherein n is 1 to 10.

26. The composition of claim 1, wherein the second active agent comprises CoQ_n , wherein n is 6 to

10.

27. The composition of claim 1, wherein the second active agent comprises CoQ_n , wherein n is 10.

28. The composition of claim 1, wherein the second active agent comprises an anti-inflammatory steroid (AIS) of formula (Ia) selected from dehydroepiandrosterone, wherein R and R^1 are H and the broken line represents a double bond, 16- α bromodehydroepiandrosterone wherein R is Br, R^1 is H and the broken line represents a double bond, 16- α fluorodehydroepiandrosterone wherein R is F, R^1 is H and the broken line represents a double bond, etiocholanolone, wherein R and R^1 are each hydrogen and the broken line represents a single bond, dehydroepiandrosterone sulfate, wherein R is H, R^1 is SO_2OM and M is a sulfatide group as defined above, and the broken line represents a double bond, the compound of formula (Ia), R is halogen selected from Br, Cl or F, R^1 is H, and the broken line represents a double bond, 16- α -fluorodehydro-epiandrosterone, or pharmaceutically or veterinarily acceptable salts thereof.

29. The composition of claim 1, wherein the oligo(s) of the first agent contains up to about 5% A.

30. The composition of claim 1, wherein the oligo(s) of the first agent is A free.

31. The composition of claim 1, wherein the second active agent comprises an anti-inflammatory steroid (AIS) of formula (Ib), wherein R^{15} and R^{16} together are $=\text{O}$; R^5 is $-\text{OH}$; R^5 is $-\text{OSO}_2\text{R}^{20}$; R^{15} and R^{20} together is H; or pharmaceutically or veterinarily acceptable salts thereof.

32. The composition of claim 1, wherein the second active agent comprises an AIS selected from budesonide, testosterone, progesterone, fluticasone, beclomethasone, prednisone, mometasone, estrogen, dexamethasone, hydrocortisone, triamcinolone, flunisolide, methylprednisolone prednisone, hydrocortisone, or analogues thereof.

33. The composition of claim 1, wherein the active agents are present in an amount of about 0.01 to about 99.99 w/w of the composition.

34. The composition of claim 1, wherein the second active agent comprises an anti-inflammatory steroid (AIS) selected from 21-acetoxypregnenolone ((3 β)-21-(acetyloxy)-3-hydroxypregn-5-en-20-one); alclometasone ((7 α , 11 β , 16 α)-7-Chloro-11, 17, 21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), or its 17,21-dipropionate form ($\text{C}_{28}\text{H}_{37}\text{ClO}_7$); algestone ((16 α)-16,17-dihydroxypregn-4-ene-3,20-dione), its cyclic acetal with acetone form ($\text{C}_{24}\text{H}_{34}\text{O}_4$), or its 16 α -methyl ether form ($\text{C}_{22}\text{H}_{32}\text{O}_4$); amcinonide ((11 β , 16 α)-21-(acetyloxy)-16,17-[cyclopentylidenebis(oxy)]-9-fluoro-11-hydroxypregna-1,4-di-ene-3,20-dione); beclomethasone ((11 β , 16 β)-9-chloro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its dipropionate form ($\text{C}_{28}\text{H}_{37}\text{ClO}_7$), or its monopropionate form; betamethasone ((11 β , 16 β)-9-fluoro-11, 17, 21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($\text{C}_{24}\text{H}_{31}\text{FO}_6$), its 21-adamantoate form ($\text{C}_{33}\text{H}_{43}\text{FO}_6$), its 17-benzoate form ($\text{C}_{29}\text{H}_{33}\text{FO}_6$), its 17, 21-dipropionate form ($\text{C}_{28}\text{H}_{37}\text{FO}_7$), its 17-valerate form ($\text{C}_{27}\text{H}_{37}\text{FO}_6$), or its 21-phosphate disodium salt form ($\text{C}_{22}\text{H}_{28}\text{FNa}_2\text{O}_8\text{P}$); budesonide ((11 β , 16 α)-16,17-[butylidenebis(oxy)]-11, 21-dihydropregna-1,4-diene-3,20-dione); chloroprednisone ((6 α)-chloro-17,21-dihydroxypregna-1,4-diene-3,11,20-trione), or its 21-acetate form ($\text{C}_{23}\text{H}_{27}\text{ClO}_6$); ciclesonide; clobetasol ((11 β , 16 β)-21-chloro-9-fluoro-11,17-dihydroxy-16-methylpregna-1,4-diene-3,20-dione), or its 17-propionate form ($\text{C}_{25}\text{H}_{32}\text{ClFO}_5$); clobetasone ((16 β)-21-chloro-9-fluoro-17-hydroxy-16-methylpregna-1,4-diene-3,11,20-trione), or its 17-butyrate form ($\text{C}_{26}\text{H}_{32}\text{ClFO}_5$); clocortolone ((6 α , 11 β , 16 α)-9-chloro-6-fluoro-11,21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($\text{C}_{24}\text{H}_{30}\text{ClFO}_5$), or its 21-pivalate form ($\text{C}_{27}\text{H}_{36}\text{ClFO}_5$); cloprednol ((11 β)-6-chloro-11,17,21-trihydroxypregna-1,4,6-triene-3,20-dione); coroxon (phosphoric acid 3-chloro-4-methyl-2-oxo-2H-1-benzopyran-7-yl diethyl ester); cortisone (17,21-dihydroxypregn-4-ene-3,11,20-trione), its 21-acetate form ($\text{C}_{23}\text{H}_{30}\text{O}_6$), or its 21-cyclopentanepropionate form ($\text{C}_{29}\text{H}_{40}\text{O}_6$); cortivazol ((11 β , 16 α)-21-(acetyloxy)-11,17-dihydroxy-6,16-dimethyl-2'-phenyl-2'-H-pregna-2,4,6-trieno[3,2-c]pyrazol-20-one); deflazacort ((11 β , 16 β)-21-(acetyloxy)-11-hydroxy-2'-methyl-5'-H-pregna-1,4-dieno[17,16-d]oxazole-3,20-dione); desonide ((11 β , 16 α)-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione); desoximetasone ((11 β , 16 α)-9-fluoro-11, 21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione); dexamethasone ((11 β , 16 α)-9-fluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($\text{C}_{24}\text{H}_{31}\text{FO}_6$), its 21-(3,3-dimethylbutyrate) form ($\text{C}_{28}\text{H}_{39}\text{FO}_6$; Chemerda et al., US Patent No. 2,939,873), its 21-diethylaminoacetate form ($\text{C}_{28}\text{H}_{41}\text{FNO}_6$), its 21-isonicotinate form ($\text{C}_{28}\text{H}_{41}\text{FNO}_6$), its 17,21-dipropionate form ($\text{C}_{28}\text{H}_{37}\text{FNO}_6$), or its 21-palmitate form ($\text{C}_{38}\text{H}_{59}\text{FO}_6$); diflorasone ((6 α , 11 β , 16 β)-6,9-difluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), or its diacetate form ($\text{C}_{26}\text{H}_{32}\text{F}_2\text{O}_7$); diflucortolone ((6 α , 11 β , 16 α)-6,9-difluoro-11,21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione),

or its 21-valerate form ($C_{27}H_{36}F_2O_5$); difluprednate ((6 α ,11 β)-21-(acetyloxy)-6,9-difluoro-11-hydroxy-17-(1-oxobutoxy)pregna-1,4-diene-3,20-dione); enoxolone ((3 β ,20 β)-3-hydroxy-11-oxoolean-12-en-29-oic acid), or its 18 α -hydrogen form; fluazacort ((11 β ,16 β)-21-(acetyloxy)-9-fluoro-11-hydroxy-2'-methyl-5'H-pregna-1,4-dieno[17,16-d]oxazole-3,20-dione); flucoronide ((6 α ,11 β ,16 α)-9,11-dichloro-6-fluoro-21-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]-pregna-1,4-diene-3,20-dione); flumethasone ((6 α ,11 β ,16 α)-6,9-difluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{24}H_{30}F_2O_6$), or its 21-pivalate form ($C_{27}H_{36}F_2O_6$); flunisolide ((6 α ,11 β ,16 α)-6-fluoro-11,21-dihydroxy-16,17-[(1-methylethylidene) bis(oxy)]pregna-1,4-diene-3,20-dione), or its 21-acetate form ($C_{26}H_{33}FO_7$); fluocinolone acetate ((6 α ,11 β ,16 α)-6,9-difluoro-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]-pregna-1,4-diene-3,20-dione); fluocinonide ((6 α ,11 β ,16 α)-21-(acetyloxy)-6,9-difluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]-pregna-1,4-diene-3,20-dione); fluocortin butyl ((6 α ,11 β ,16 α)-6-fluoro-11-hydroxy-16-methyl-3,20-dioxopregna-1,4-dien-21-oic acid butyl ester); fluocortolone ((6 α ,11 β ,16 α)-6-fluoro-11,21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{24}H_{31}FO_5$), its 21-hexanoate form ($C_{28}H_{39}FO_5$), or its 21-pivalate form ($C_{22}H_{37}FO_5$); fluorometholone ((6 α ,11 β)-9-fluoro-11,17-dihydroxy-6-methylpregna-1,4-diene-3,20-dione), or its 17-acetate form ($C_{24}H_{31}FO_5$); fluperolone acetate ((11 β ,17 α ,17(S))-17-[2-(acetyloxy)-1-oxopropyl]-9-fluoro-11,17-dihydroxyandrosta-1,4-dien-3-one); fluprednidene acetate ((11 β)-21-(acetyloxy)-9-fluoro-11,17-dihydroxy-16-methylenepregna-1,4-diene-3,20-dione); fluprednisolone ((6 α ,11 β)-6-fluoro-11,17,21-trihydroxypregna-1,4-diene-3,20-dione), or its 21-acetate form ($C_{23}H_{29}FO_6$); flurandrenolide ((6 α ,11 β ,16 α)-6-fluoro-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-4-ene-3,20-dione); fluticasone propionate ((6 α ,11 β ,16 α ,17 α)-6,9-difluoro-11-hydroxy-16-methyl-3-oxo-17-(1-oxopropoxy)androsta-1,4-diene-17-carbothioic acid S-(fluoromethyl) ester); formocortal ((11 β ,16 α)-21-(acetyloxy)-3-(2-chloroethoxy)-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]-20-oxopregna-3,5-diene-6-carboxaldehyde); halcinonide ((11 β ,16 α)-21-chloro-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-4-ene-3,20-dione); halobetasol propionate (6 α ,11 β ,16 β)-21-chloro-6,9-difluoro-11-hydroxy-16-methyl-17-(1-oxopropoxy)pregna-1,4-diene-3,20-dione); halometasone ((6 α ,11 β ,16 α)-2-chloro-6,9-difluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), or its monohydrate form ($C_{22}H_{27}ClF_2O_5 \cdot H_2O$); halopredone acetate ((6 β ,11 β)-17,21-bis(acetyloxy)-2-bromo-6,9-difluoro-11-hydroxypregna-1,4-diene-3,20-dione); hydrocortamate (N,N-diethylglycine (11 β)-11,17-dihydroxy-3,20-dioxopregna-4-en-21-yl ester), or its hydrochloride form ($C_{27}H_{41}NO_6 \cdot HCl$); hydrocortisone ((11 β)-11,17,21-trihydroxypregna-4-ene-3,20-dione), its 21-acetate form ($C_{23}H_{32}O_6$), its 17-butyrate form ($C_{25}H_{36}O_6$), its 21-phosphate disodium salt form ($C_{21}H_{29}Na_2O_8P$), its 21-sodium succinate form ($C_{25}H_{33}NaO_8$), its 17-valerate form ($C_{26}H_{38}O_6$), or its cypionate form; loteprednol etabonate ((11 β ,17 α)-17-[(ethoxycarbonyl)oxy]-11-hydroxy-3-oxoandrosta-1,4-diene-17-carboxylic acid chloromethyl ester); mazipredone ((11 β)-11,17-dihydroxy-21-(4-methyl-1-piperazinyl)pregna-1,4-diene-3,20-dione), or its hydrochloride form ($C_{26}H_{38}N_2O_4 \cdot HCl$); medrysone ((6 α ,11 β)-11-hydroxy-6-methylpregna-4-ene-3,20-dione); meprednisone ((16 β)-17,21-dihydroxy-16-methylpregna-1,4-diene-3,11,20-trione), or its 21-acetate form ($C_{24}H_{30}O_6$); methylprednisolone ((6 α ,11 β)-11,17,21-trihydroxy-6-methylpregna-1,4-diene-3,20-dione; Sebek and Spero, US Patent No. 2,897,218, and Gould, US Patent No. 3,053,832), its 21-acetate form ($C_{24}H_{32}O_6$), its 21-phosphate disodium salt form ($C_{22}H_{29}Na_2O_8P$), its 21-succinate sodium salt form ($C_{26}H_{33}NaO_8$), or its aceponate form ($C_{27}H_{36}O_7$); mometasone furoate ((11 β ,16 α)-9,21-dichloro-17-[(2-furanylcarbonyl)oxy]-11-hydroxy-16-methylpregna-1,4-diene-3,20-dione); paramethasone ((6 α ,11 β ,16 α)-6-fluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{24}H_{31}FO_6$), its disodium phosphate form, or a mixture of its 21-acetate and disodium phosphate form; prednicarbate ((11 β)-17[(ethoxycarbonyl)oxy]-11-hydroxy-21-(1-oxopropoxy)pregna-1,4-diene-3,20-dione); prednisolone ((11 β)-11,17,21-trihydroxypregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{23}H_{30}O_6$), its 21-*tert*-butylacetate form ($C_{27}H_{38}O_6$; Sarrett), its 21-hydrogen succinate form ($C_{25}H_{32}O_8$), its 21-succinate sodium salt form ($C_{25}H_{31}NaO_8$), its 21-stearoylglycolate form ($C_{41}H_{64}O_8$), its 21-*m*-sulphobenzoate sodium salt form ($C_{28}H_{31}NaO_9S$; (11 β)-11,17-dihydroxy-21-[(3-sulphobenzoyl)oxy]pregna-1,4-diene-3,20-dione monosodium salt), or its 21-trimethylacetate form ($C_{26}H_{36}O_6$); prednisolone 21-diethylaminoacetate (N,N-diethylglycine (11 β)-11,17-dihydroxy-3,20-dioxopregna-1,4-dien-21-yl ester; British Patent No. 862,370), or its hydrochloride form ($C_{27}H_{39}NO_6 \cdot HCl$); prednisolone sodium phosphate (11,17-dihydroxy-21-(phosphonooxy)pregna-1,4-diene-3,20-dione disodium salt); prednisone (17,21-dihydroxypregna-1,4-diene-3,11,20-trione), or its 21-acetate form ($C_{23}H_{28}O_6$); prednival ((11 β)-11,21-dihydroxy-17-[(1-oxopentyl)oxy]pregna-1,4-

diene-3,20-dione;), or its 21-acetate form ($C_{28}H_{38}O_7$); prednylidene ((11 β)-11,17,21-trihydroxy-16-methylenepregna-1,4-diene-3,20-dione), or its 21-diethylaminoacetate hydrochloride form ($C_{28}H_{39}NO_6 \cdot HCl$); rimexolone ((11 β ,16 α ,17 β)-11-hydroxy-16,17-dimethyl-17-(1-oxopropyl)androsta-1,4-dien-3-one); rofleponide ((22R)-6 α ,9 α -Difluoro-11 β ,21-dihydroxy-16 α ,17 α -propylmethylenedioxypregn-4-ene-3,20-dione); tipredane ((11 β , 17 α)-17-(ethylthio)-9 α -fluoro-11 β -hydroxy-17-(methylthio) androsta-1,4-dien-3-one); tixocortol ((11 β)-11,17-dihydroxy-21-mercaptopregn-4-ene-3,20-dione), or its 21-pivalate form ($C_{26}H_{38}O_5S$; (11 β)-21-[(2,2-dimethyl-1-oxopropyl)thio]-11,17-dihydroxypregn-4-ene-3,20-dione); triamcinolone ((11 β ,16 α)-9-fluoro-11,16,17,21-tetrahydroxypregna-1,4-diene-3,20-dione), or its 16,21-diacetate form ($C_{25}H_{31}FO_8$; (11 β ,16 α)-16,21-bis(acetyloxy)-9-fluoro-11,17-dihydroxypregna-1,4-diene-3,20-dione); Triamcinolone acetonide ((11 β ,16 α)-9-fluoro-11,21-dihydroxy-16,17-[1-methylethylidenebis(oxy)]pregna-1,4-diene-3,20-dione), its 21-acetate crystal form, its 21-disodium phosphate form ($C_{24}H_{30}FNa_2O_9P$), or its 21-hemisuccinate form ($C_{28}H_{35}FO_9$); triamcinolone benetonide ((11 β ,16 α)-21-[3-(benzoylamino)-2-methyl-1-oxopropoxy]-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione); or triamcinolone hexacetonide; ((11 β ,16 α)-21-(3,3-dimethyl-1-oxobutoxy)-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione), analogues thereof, or pharmaceutically or veterinarily acceptable salts thereof.

35. The composition of claim 1, wherein the second agent comprises a glucocorticoid steroid selected from budesonide, testosterone, progesterone, estrogen, flunisolide, triamcinolone, beclomethasone, betamethasone, dexamethasone, fluticasone, methylprednisolone, prednisone, hydrocortisone, or mometasone.

36. The composition of claim 1, wherein the first active agent comprises a single stranded anti-sense DNA oligo.

37. The composition of claim 1, wherein the first active agent comprise(s) a double stranded DNA oligo.

38. The composition of claim 1, wherein the first active agent comprises a single stranded anti-sense RNA oligo(s).

39. The composition of claim 1, wherein the first active agent comprises a double stranded RNA oligo(s).

40. The composition of claim 1, which is a systemic or topical formulation.

41. The formulation of claim 40, selected from oral, intrabuccal, intrapulmonary, rectal, intrauterine, intratumor, intracranial, nasal, intramuscular, subcutaneous, intravascular, intrathecal, inhalable, transdermal, intradermal, intracavitary, implantable, iontophoretic, ocular, vaginal, intraarticular, otical, intravenous, intramuscular, intraglandular, intraorgan, intralymphatic, implantable, slow release or enteric coating formulations.

42. The formulation of claim 41, which is an oral formulation, wherein the carrier is selected from solid or liquid carriers.

43. The formulation of claim 42, in the form of a powder, dragees, tablets, capsules, sprays, aerosols, solutions, suspensions and emulsions, or optionally oil-in-water or water-in-oil emulsions.

44. The formulation of claim 41, which is a topical formulation, in the form of cream, gel, ointment, spray, aerosol, patch, solution, suspension or emulsion.

45. The formulation of claim 41, which is an injectable formulation, in the form of an aqueous or alcoholic solution or suspension, an oily solution or suspension, or an oil-in-water or water-in-oil emulsion.

46. The formulation of claim 41, in the form of a rectal or vaginal formulation, optionally a suppository.

47. The formulation of claim 41, in the form of a transdermal formulation, wherein the carrier comprises an aqueous or alcoholic solution, an oily solution or suspension, or an oil-in-water or water-in-oil emulsion.

48. The formulation of claim 47, in the form of an iontophoretic transdermal formulation, wherein the carrier comprises an aqueous or alcoholic solution, an oily solution or suspension, or an oil-in-water or water-in-oil emulsion, and wherein the formulation further comprises a transdermal transport promoting agent.

49. The formulation of claim 41, in the form of an implant, a capsule, a cartridge or a blister.

50. The formulation of claim 49, in the form of an aqueous or alcoholic solution or suspension, an oily solution or suspension, or an oil-in-water or water-in-oil emulsion.

51. The formulation of claim 40, wherein the carrier comprises a hydrophobic carrier.

52. The formulation of claim 51, wherein the carrier comprises lipid vesicles, optionally liposomes; or particles, optionally microcrystals.
53. The formulation of claim 52, wherein the carrier comprises liposomes, and the liposomes comprise the active agent(s).
54. The formulation of claim 41, which is a respirable or inhalable formulation, optionally aerosolizable or sprayable of particle size about 0.05 to about 10 micron.
55. The formulation of claim 54, having a particle size about 0.1 to about 5 micron.
56. The formulation of claim 41, which is a nasal or intrapulmonary formulation, optionally aerosolizable or sprayable of particle size about 8 to about 200 micron.
57. The formulation of claim 56, of particle size about 10 to about 50 micron.
58. The formulation of claim 41, in single or multiple unit form.
59. The formulation of claim 41, in bulk.
60. A therapeutic or prophylactic kit, comprising a delivery device; in separate containers, the active agent(s) of claim 1; and instructions for adding a carrier and preparing a formulation and for use of the kit.
61. The kit of claim 60, wherein the device delivers single metered doses of the formulation.
62. The kit of claim 60, wherein the formulation is a respirable formulation, and the delivery device comprises a nebulizer or a dry powder inhaler.
63. The kit of claim 62, wherein the device comprises a nebulizer or an insufflator and the formulation is provided in a pierceable or openable capsule or cartridge.
64. The kit of claim 60, wherein the delivery device comprises a pressurized inhaler and the agent(s) is (are) provided as a suspension, solution or dry formulation of the active agent(s).
65. The kit of claim 60, further comprising, in a separate container, an agent selected from other therapeutic agents, surfactants, anti-oxidants, flavoring agents, fillers, volatile oils, dispersants, antioxidants, propellants, preservatives, buffering agents, RNA inactivating agents, cell-internalized or up-taken agents or coloring agents.
66. The kit of claim 60, comprising, in separate containers, one or more oligos, one or more AIS of formula (Ia), or (Ib) one or more surfactants, a carrier or diluent, optionally other therapeutic agents, and instructions for scheduling the administration of first and second agents.
67. The kit of claim 66, further comprising one or more ubiquinone(s), and instructions for scheduling the administration of first and second agents.
68. The kit of claim 60, wherein the device is a transdermal delivery device, and the kit further comprises a transdermal delivery agent, a transdermal carrier or diluent, and instructions for preparing and delivering a transdermal delivery formulation.
69. The kit of claim 60, wherein the device is an iontophoretic delivery device, and the kit further comprises an iontophoretic agent(s) and instructions for preparing and delivering an iontophoretic formulation.
70. The kit of claim 60, comprising, in separate containers, one or more oligo(s), one or more ubiquinone(s), one or more surfactants, a carrier or diluent, optionally other therapeutic agents, and instructions for scheduling the administration of first and second agents.
71. A method of preventing or treating a respiratory, lung or malignant disease or condition, comprising simultaneously, sequentially or separately administering to a subject in need of treatment, preventative, prophylactic or therapeutic amounts of the first and second active agents of claim 1.
72. The method of claim 71, wherein the oligo(s) and the AIS are administered in amounts effective for alleviating bronchoconstriction and/or lung inflammation or allergy(ies) and/or surfactant depletion or hyposecretion.
73. The method of claim 71, wherein the oligo(s) and the ubiquinone(s) are administered in amounts effective for alleviating bronchoconstriction, lung inflammation or allergies, or ubiquinone or lung surfactant depletion.
74. The method of claim 71, wherein one or more of the agent(s) is (are) administered as a nasal, inhalable, respirable or intrapulmonary composition(s) into the subject's respiratory system.
75. The method of claim 74, wherein one or more of the agents are administered intrapulmonarily or by inhalation.
76. The method of claim 74, wherein the respirable or inhalable composition(s) comprise(s) particles

about 0.05 to about 10 micron in size.

77. The method of claim 74, wherein the nasal or intrapulmonary composition comprises particles about 8 to about 100 micron in diameter.

78. The method of claim 74, wherein the composition(s) is (are) administered as a respirable aerosol.

79. The method of claim 71, wherein the ubiquinone(s) is (are) administered orally, and the oligo(s) and the AIS are administered through the respiratory tract.

80. The method of claim 71, wherein the disease or condition is associated with pulmonary obstruction, bronchoconstriction, lung inflammation or allergy(ies), adenosine hypersensitivity, adenosine or adenosine receptor(s), hyperproduction, or surfactant or ubiquinone hypoproduction.

81. The method of claim 71, wherein the disease or condition comprises pulmonary vasoconstriction, respiratory inflammation or allergies, asthma, impeded respiration, respiratory distress syndrome (RDS), lung pain, cystic fibrosis (CF), allergic rhinitis (AR), apnea, pulmonary hypertension, emphysema, chronic obstructive pulmonary disease (COPD), pulmonary transplantation rejection, pulmonary fibrosis, pulmonary infections, bronchitis, or cancer.

82. The method of claim 71, wherein the disease or condition is associated with respiratory allergies, and the first active agent(s) is anti-sense to the initiation codon, the coding region, the 5'-end or the 3'-end genomic flanking regions, the 5' or 3' intron-exon junctions, or regions within 2 to 10 nucleotides of the junctions of at least one gene(s) encoding, or regulating expression of, an immunoglobulin(s), antibody(ies), or immunoglobulin or antibody receptors, or are anti-sense to the immunoglobulin(s), antibody(ies), or immunoglobulin or antibody receptor mRNA; MTAs of the oligo(s) or combinations thereof.

83. The method of claim 71, wherein the disease or condition is associated with a malignancy or cancer, and the oligo is anti-sense to the initiation codon, the coding region, the 5'-end or the 3'-end genomic flanking regions, the 5' or 3' intron-exon junctions, or regions within 2 to 10 nucleotides of the junctions of an oncogene(s) or at least one gene that regulates expression of, or encodes, a malignancy associated protein, or is(are) anti-sense to the oncogene or malignancy associated mRNA; MTAs or combinations thereof.

84. The method of claim 71, wherein the composition is administered transdermally or systemically.

85. The method of claim 71, wherein the composition is administered orally, intracavitarily, intranasally, intraurethral, intracavernous, intraanally, intravaginally, intrauterally, intraarticularly, transdermally, intrabucally, intravenously, subcutaneously, intramuscularly, intravascularly, intratumorously, intraglandularly, intraocularly, intracranial, into an organ, intravascularly, intrathecally, intralymphatically, intraotically, by implantation, by inhalation, intradermally, intrapulmonarily, intraotically, by slow release, by sustained release and by a pump.

86. The method of claim 71, wherein the mammal(s) is a human or non-human mammal.

87. The method of claim 71, wherein the oligo(s) is (are) administered in amount of about 0.005 to about 150 mg/kg body weight.

88. The method of claim 71, wherein the oligo(s) contain(s) up to about 15%A.

89. The method of claim 71, wherein the oligo(s) is (are) substantially free of A.

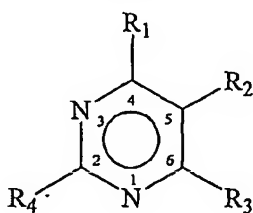
90. The method of claim 71, wherein the target comprises transcription factors, stimulating or activating factors, interleukins, interleukin receptors, chemokines, chemokine receptors, endogenously produced specific or non-specific enzymes, immunoglobulins, antibody receptors, central nervous system (CNS) or peripheral nervous or non-nervous system receptors, CNS and peripheral nervous and non-nervous system peptide transmitters, adhesion molecules, defensins, growth factors, microbial targets, vasoactive peptides, peptide receptors or binding proteins, or malignancy associated proteins.

91. The method of claim 71, wherein one or more As in the oligo(s) is(are) substituted by a universal base that comprise(s) a heteroaromatic base(s) that bind(s) to thymidine or uridine but has(have) less than about 0.3 of the adenosinebase agonist or antagonist activity at an adenosine A₁, A_{2a}, A_{2b} or A₃ receptor.

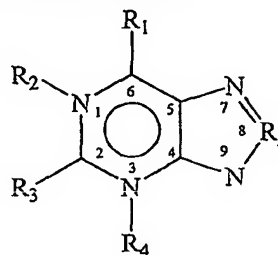
92. The method of claim 91, wherein the heteroaromatic base(s) comprise(s) pyrimidines or purines, which may be substituted by O, halo, NH₂, SH, SO, SO₂, SO₃, COOH, branched or fused primary or secondary amino, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, alkoxy, alkenoxy, acyl, cycloacyl, arylacyl, alkynoxy, cycloalkoxy, aroyl, arylthio, arylsulfoxyl, halocycloalkyl, alkylcycloalkyl, alkenylcycloalkyl, alkynylcycloalkyl, haloaryl, alkylaryl, alkenylaryl, alkynylaryl, arylalkyl, arylalkenyl, arylalkynyl, arylcycloalkyl, all of which may be further substituted by O, halo, NH₂, primary, secondary or tertiary amine, SH, SO, SO₂, SO₃,

cycloalkyl, heterocycloalkyl or heteroaryl.

93. The method of claim 91, wherein the purines are substituted at positions 1, 2, 3, 6, and/or 8, the pyrimidines are substituted at positions 2, 3, 4, 5 and/or 6 and have the chemical formula



pyrimidines



purines

or

wherein R^1 , R^2 , R^3 , R^4 and R^5 are independently H, alkyl, alkenyl or alkynyl and R^3 is H, aryl, dicycloalkyl, dicycloalkenyl, dicycloalkynyl, cycloalkyl, cycloalkenyl, cycloalkynyl, O-cycloalkyl, O-cycloalkenyl, O-cycloalkynyl, NH_2 -alkylamino-ketoxyalkoxy-aryl, or mono or dialkylaminoalkyl-N-alkylamino- SO_2 aryl, and R^4 and R^5 are independently R^1 and together are R^3 , and the pyrimidines and purines optionally comprise theophylline, caffeine, dyphylline, etophylline, acephylline piperazine, bamifylline, enprofylline or xanthine.

94. The method of claim 93, wherein the universal base(s) comprise(s) 3-nitropyrrole-2'-deoxynucleoside, 5-nitro-indole, 2-deoxyribosyl-(5-nitroindole), 2-deoxyribofuranosyl-(5-nitroindole), 2'-deoxyinosine, 2'-deoxynebularine, 6H, 8H-3,4-dihydropyrimido [4,5-c] oxazine-7-one, or 2-amino-6-methoxyaminopurine.

95. The method of claim 71, wherein the second active agent comprises an AIS of formula (Ia) selected from dehydroepiandrosterone, 16-α-bromodehydroepiandrosterone, 16-α-fluorodehydroepiandrosterone, etiocholanolone, dehydroepiandrosterone sulfate or other pharmaceutically or veterinarily acceptable salts thereof.

96. The method of claim 71, wherein the second active agent comprises an AIS formula (Ib), wherein R^{15} and R^{16} together are $=O$; R^5 is $-OH$; R^5 is $-OSO_2R^{20}$; R^{15} and R^{20} together is H; or pharmaceutically or veterinarily acceptable salts thereof.

97. The method of claim 71, wherein the active agents are present in an amount of about 0.01 to about 99.99 w/w of the composition.

98. The method of claim 71, wherein the second active agent comprises an AIS selected from 21-acetoxypregnenolone ((3β)-21-(acetyloxy)-3-hydroxypregna-5-en-20-one); alclometasone ((7α, 11β, 16α)-7-Chloro-11, 17, 21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), or its 17,21-dipropionate form ($C_{28}H_{37}ClO_7$); algestone ((16α)-16,17-dihydroxypregna-4-ene-3,20-dione), its cyclic acetal with acetone form ($C_{24}H_{34}O_4$), or its 16α-methyl ether form ($C_{22}H_{32}O_4$); amcinonide ((11β, 16α)-21-(acetyloxy)-16,17-[cyclopentylidenebis(oxy)]-9-fluoro-11-hydroxypregna-1,4-di-ene-3,20-dione); beclomethasone ((11β,16β)-9-chloro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its dipropionate form ($C_{28}H_{37}ClO_7$), or its monopropionate form; betamethasone ((11β, 16β)-9-fluoro-11, 17, 21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{24}H_{31}FO_6$), its 21-adamantoate form ($C_{33}H_{43}FO_6$), its 17-benzoate form ($C_{29}H_{33}FO_6$), its 17, 21-dipropionate form ($C_{28}H_{37}FO_7$), its 17-valerate form ($C_{27}H_{37}FO_6$), or its 21-phosphate disodium salt form ($C_{22}H_{28}FN_2O_8P$); budesonide ((11β, 16α)-16,17-[butylidenebis(oxy)]-11, 21-dihydropregna-1,4-diene-3,20-dione); chloroprednisone ((6α)-chloro-17,21-dihydroxypregna-1,4-diene-3,11,20-trione), or its 21-acetate form ($C_{23}H_{27}ClO_6$); ciclesonide; clobetasol ((11β,16β)-21-chloro-9-fluoro-11,17-dihydroxy-16-methylpregna-1,4-diene-3,20-dione), or its 17-propionate form ($C_{25}H_{32}ClFO_5$); clobetasone ((16β)-21-chloro-9-fluoro-17-hydroxy-16-methylpregna-1,4-diene-3,11,20-trione), or its 17-butyrate form ($C_{26}H_{32}ClFO_5$); clocortolone ((6α,11β,16α)-9-chloro-6-fluoro-11,21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{24}H_{30}ClFO_5$), or its 21-pivalate form ($C_{27}H_{36}ClFO_5$); cloprednol ((11β)-6-chloro-11,17,21-trihydroxypregna-1,4,6-triene-3,20-dione); coroxon

(phosphoric acid 3-chloro-4-methyl-2-oxo-2H-1-benzopyran-7-yl diethyl ester); cortisone (17,21-dihydroxypregn-4-ene-3,11,20-trione), its 21-acetate form ($C_{23}H_{30}O_6$), or its 21-cyclopentanepropionate form ($C_{29}H_{40}O_6$); cortivazol ((11 β ,16 α)-21-(acetyloxy)-11,17-dihydroxy-6,16-dimethyl-2'-phenyl-2'H-pregna-2,4,6-trieno[3,2-c]pyrazol-20-one); deflazacort ((11 β ,16 β)-21-(acetyloxy)-11-hydroxy-2'-methyl-5'H-pregna-1,4-dieno[17,16-d]oxazole-3,20-dione); desonide ((11 β ,16 α)-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione); desoximetasone ((11 β ,16 α)-9-fluoro-11, 21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione); dexamethasone ((11 β ,16 α)-9-fluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{24}H_{31}FO_6$), its 21-(3,3-dimethylbutyrate) form ($C_{28}H_{39}FO_6$; Chemerda et al., US Patent No. 2,939,873), its 21-diethylaminoacetate form ($C_{28}H_{41}FNO_6$), its 21-isonicotinate form ($C_{28}H_{41}FNO_6$), its 17,21-dipropionate form ($C_{28}H_{37}FNO_6$), or its 21-palmitate form ($C_{38}H_{59}FO_6$); diflorasone ((6 α ,11 β ,16 β)-6,9-difluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), or its diacetate form ($C_{26}H_{32}F_2O_7$); diflucortolone ((6 α ,11 β ,16 α)-6,9-difluoro-11,21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione), or its 21-valerate form ($C_{27}H_{36}F_2O_5$); difluprednate ((6 α ,11 β)-21-(acetyloxy)-6,9-difluoro-11-hydroxy-17-(1-oxobutoxy)pregna-1,4-diene-3,20-dione); enoxolone ((3 β ,20 β)-3-hydroxy-11-oxoolean-12-en-29-oic acid), or its 18 α -hydrogen form; fluazacort ((11 β ,16 β)-21-(acetyloxy)-9-fluoro-11-hydroxy-2'-methyl-5'H-pregna-1,4-dieno[17,16-d]oxazole-3,20-dione); flucoronide ((6 α ,11 β ,16 α)-9,11-dichloro-6-fluoro-21-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione); flumethasone ((6 α ,11 β ,16 α)-6,9-difluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{24}H_{30}F_2O_6$), or its 21-pivalate form ($C_{27}H_{36}F_2O_6$); flunisolide ((6 α ,11 β ,16 α)-6-fluoro-11,21-dihydroxy-16,17-[(1-methylethylidene) bis(oxy)]pregna-1,4-diene-3,20-dione), or its 21-acetate form ($C_{26}H_{33}FO_7$); fluocinolone acetate ((6 α ,11 β ,16 α)-6,9-difluoro-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione); fluocinonide ((6 α ,11 β ,16 α)-21-(acetyloxy)-6,9-difluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione); flucortin butyl ((6 α ,11 β ,16 α)-6-fluoro-11-hydroxy-16-methyl-3,20-dioxopregna-1,4-dien-21-oic acid butyl ester); flucortolone ((6 α ,11 β ,16 α)-6-fluoro-11,21-dihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{24}H_{31}FO_5$), its 21-hexanoate form ($C_{28}H_{39}FO_5$), or its 21-pivalate form ($C_{22}H_{37}FO_5$); fluorometholone ((6 α ,11 β)-9-fluoro-11,17-dihydroxy-6-methylpregna-1,4-diene-3,20-dione), or its 17-acetate form ($C_{24}H_{31}FO_5$); fluperolone acetate ((11 β ,17 α ,17(S))-17-[2-(acetyloxy)-1-oxopropyl]-9-fluoro-11,17-dihydroxyandrost-1,4-dien-3-one); fluprednidene acetate ((11 β)-21-(acetyloxy)-9-fluoro-11,17-dihydroxy-16-methylenepregna-1,4-diene-3,20-dione); fluprednisolone ((6 α ,11 β)-6-fluoro-11,17,21-trihydroxypregna-1,4-diene-3,20-dione), or its 21-acetate form ($C_{23}H_{29}FO_6$); flurandrenolide ((6 α ,11 β ,16 α)-6-fluoro-11,21-dihydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregn-4-ene-3,20-dione); fluticasone propionate ((6 α ,11 β ,16 α ,17 α)-6,9-difluoro-11-hydroxy-16-methyl-3-oxo-17-(1-oxopropoxy)androst-1,4-diene-17-carbothioic acid S-(fluoromethyl) ester); formocortol ((11 β ,16 α)-21-(acetyloxy)-3-(2-chloroethoxy)-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]-20-oxopregna-3,5-diene-6-carboxaldehyde); halcinonide ((11 β ,16 α)-21-chloro-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregn-4-ene-3,20-dione); halobetasol propionate ((6 α ,11 β ,16 β)-21-chloro-6,9-difluoro-11-hydroxy-16-methyl-17-(1-oxopropoxy)pregna-1,4-diene-3,20-dione); halometasone ((6 α ,11 β ,16 α)-2-chloro-6,9-difluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), or its monohydrate form ($C_{22}H_{27}ClF_2O_5 \cdot H_2O$); halopredone acetate ((6 β ,11 β)-17,21-bis(acetyloxy)-2-bromo-6,9-difluoro-11-hydroxypregna-1,4-diene-3,20-dione); hydrocortamate (N,N-diethylglycine (11 β)-11,17-dihydroxy-3,20-dioxopregna-4-en-21-yl ester), or its hydrochloride form ($C_{27}H_{41}NO_6 \cdot HCl$); hydrocortisone ((11 β)-11,17,21-trihydroxypregna-4-ene-3,20-dione), its 21-acetate form ($C_{23}H_{32}O_6$), its 17-butyrate form ($C_{25}H_{36}O_6$), its 21-phosphate disodium salt form ($C_{21}H_{29}Na_2O_8P$), its 21-sodium succinate form ($C_{25}H_{33}NaO_8$), its 17-valerate form ($C_{26}H_{38}O_6$), or its cypionate form; loteprednol etabonate ((11 β ,17 α)-17-[(ethoxycarbonyl)oxy]-11-hydroxy-3-oxoandrost-1,4-diene-17-carboxylic acid chloromethyl ester); mazipredone ((11 β)-11,17-dihydroxy-21-(4-methyl-1-piperazinyl)pregna-1,4-diene-3,20-dione), or its hydrochloride form ($C_{26}H_{38}N_2O_4 \cdot HCl$); medrysone ((6 α ,11 β)-11-hydroxy-6-methylpregn-4-ene-3,20-dione); meprednisone ((16 β)-17,21-dihydroxy-16-methylpregna-1,4-diene-3,11,20-trione), or its 21-acetate form ($C_{24}H_{30}O_6$); methylprednisolone ((6 α ,11 β)-11,17,21-trihydroxy-6-methylpregna-1,4-diene-3,20-dione; Sebek and Spero, US Patent No. 2,897,218, and Gould, US Patent No. 3,053,832), its 21-acetate form ($C_{24}H_{32}O_6$), its 21-phosphate disodium salt form ($C_{22}H_{29}Na_2O_8P$), its 21-succinate sodium salt form ($C_{26}H_{33}NaO_8$), or its aceponate form ($C_{27}H_{36}O_7$); mometasone furoate ((11 β ,16 α)-9,21-dichloro-17-[(2-furanylcarbonyl)oxy]-11-hydroxy-16-methylpregna-1,4-diene-3,20-dione); paramethasone ((6 α ,11 β ,16 α)-6-

fluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{24}H_{31}FO_6$), its disodium phosphate form, or a mixture of its 21-acetate and disodium phosphate form; prednicarbate ((11 β)-17[(ethoxycarbonyl)oxy]-11-hydroxy-21-(1-oxopropoxy)pregna-1,4-diene-3,20-dione); prednisolone ((11 β)-11,17,21-trihydroxypregna-1,4-diene-3,20-dione), its 21-acetate form ($C_{23}H_{30}O_6$), its 21-*tert*-butylacetate form ($C_{27}H_{38}O_6$; Sarrett), its 21-hydrogen succinate form ($C_{25}H_{32}O_8$), its 21-succinate sodium salt form ($C_{25}H_{31}NaO_8$), its 21-stearoylglycolate form ($C_{41}H_{64}O_8$), its 21-*m*-sulfobenzoate sodium salt form ($C_{28}H_{31}NaO_9S$; (11 β)-11,17-dihydroxy-21-[(3-sulfobenzoyl)oxy]pregna-1,4-diene-3,20-dione monosodium salt), or its 21-trimethylacetate form ($C_{26}H_{36}O_6$); prednisolone 21-diethylaminoacetate (N,N-diethylglycine (11 β)-11,17-dihydroxy-3,20-dioxopregna-1,4-dien-21-yl ester; British Patent No. 862,370), or its hydrochloride form ($C_{27}H_{39}NO_6 \cdot HCl$); prednisolone sodium phosphate (11,17-dihydroxy-21-(phosphonooxy)pregna-1,4-diene-3,20-dione disodium salt); prednisone (17,21-dihydroxypregna-1,4-diene-3,11,20-trione), or its 21-acetate form ($C_{23}H_{28}O_6$); prednival ((11 β)-11,21-dihydroxy-17-[(1-oxopentyl)oxy]pregna-1,4-diene-3,20-dione), or its 21-acetate form ($C_{28}H_{38}O_7$); prednylidene ((11 β)-11,17,21-trihydroxy-16-methylenepregna-1,4-diene-3,20-dione), or its 21-diethylaminoacetate hydrochloride form ($C_{28}H_{39}NO_6 \cdot HCl$); rimexolone ((11 β ,16 α ,17 β)-11-hydroxy-16,17-dimethyl-17-(1-oxopropyl)androst-1,4-dien-3-one); rolfeponide ((22R)-6 α ,9 α -Difluoro-11 β ,21-dihydroxy-16 α ,17 α -propylmethylenedioxypregn-4-ene-3,20-dione); tipredane ((11 β , 17 α)-17-(ethylthio)-9 α -fluoro-11 β -hydroxy-17-(methylthio) androst-1,4-dien-3-one); tixocortol ((11 β)-11,17-dihydroxy-21-mercaptopregn-4-ene-3,20-dione), or its 21-pivalate form ($C_{26}H_{38}O_5S$; (11 β)-21-[(2,2-dimethyl-1-oxopropyl)thio]-11,17-dihydroxypregn-4-ene-3,20-dione); triamcinolone ((11 β ,16 α)-9-fluoro-11,16,17,21-tetrahydroxypregna-1,4-diene-3,20-dione), or its 16,21-diacetate form ($C_{25}H_{31}FO_8$; (11 β ,16 α)-16,21-bis(acetyloxy)-9-fluoro-11,17-dihydroxypregna-1,4-diene-3,20-dione); Triamcinolone acetonide ((11 β ,16 α)-9-fluoro-11,21-dihydroxy-16,17-[1-methylethylidenebis(oxy)]pregna-1,4-diene-3,20-dione), its 21-acetate crystal form, its 21-disodium phosphate form ($C_{24}H_{30}FNa_2O_9P$), or its 21-hemisuccinate form ($C_{28}H_{35}FO_9$); triamcinolone benetonide ((11 β ,16 α)-21-[3-(benzoylamino)-2-methyl-1-oxopropoxy]-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene)bis(oxy)]pregna-1,4-diene-3,20-dione); or triamcinolone hexacetone ((11 β ,16 α)-21-(3,3-dimethyl-1-oxobutoxy)-9-fluoro-11-hydroxy-16,17-[(1-methylethylidene) bis(oxy)]pregna-1,4-diene-3,20-dione), or pharmaceutically or veterinarily acceptable salts thereof.

99. The method of claim 71, wherein the second active agent comprises an AIS selected from budesonide, testosterone, progesterone, estrogen, flunisolide, triamcinolone, beclomethasone, betamethasone, dexamethasone, fluticasone, methylprednisolone, prednisone, hydrocortisone, or mometasone.

100. A method of enhancing the prophylactic or therapeutic respiratory effect of an anti-inflammatory steroid in a subject, comprising administering to the subject, in addition to the AIS, the oligonucleotide(s) (oligo(s)) of claim 1, the AIS and the oligo(s) being administered in amounts effective for reducing or depleting levels of, or reducing sensitivity to, adenosine, reducing levels of adenosine receptors, producing bronchodilation, increasing levels of ubiquinone or lung surfactant in a subject's tissue (s), or treating bronchoconstriction, lung inflammation or lung allergies or a respiratory or lung disease or condition.

101. The method of claim 100, further administering to the subject a ubiquinone of the chemical formula.

102. The method of claim 100, wherein the steroid comprises budesonide, testosterone, progesterone, estrogen, flunisolide, triamcinolone, beclomethasone, betamethasone, dexamethasone, fluticasone, methylprednisolone, prednisone, hydrocortisone, or mometasone

103. The method of claim 100, wherein the oligo(s) is anti-sense to the initiation codon, the coding region, the 5'-end or the 3'-end genomic flanking regions, the 5' or 3' intron-exon junctions, and regions within 2 to 10 nucleotides of the junctions of at least one oncogene(s) and a gene(s) encoding or regulating expression of a target polypeptide(s) associated with lung airway dysfunction, or anti-sense to the corresponding mRNA and the polypeptide mRNA; combinations, MTAs or mixtures of the oligos; the polypeptides comprising peptide factors and transmitters, antibodies, cytokines or chemokines, enzymes, binding proteins, adhesion molecules, their receptors, or malignancy associated proteins.

104. The method of claim 100, further comprising administering to the subject other therapeutic or bioactive agents selected from analgesics, pre-menstrual medications, menopausal agents, anti-aging agents, anti-anxiety agents, mood disorder agents, anti-depressants, anti-bipolar mood agents, anti-schizophrenic agents, anti-cancer agents, alkaloids, blood pressure controlling agents, muscle relaxants, steroids, soporific agents, anti-

ischemic agents, anti-arrhythmic agents, contraceptives, vitamins, minerals, tranquilizers, neurotransmitter regulating agents, wound healing agents, anti-angiogenic agents, cytokines, growth factors, B-adrenergic receptor agonists, anti-metastatic agents, antacids, anti-histaminic agents, anti-bacterial agents, anti-viral agents, anti-gas agents, appetite suppressants, sun screens, emollients, skin temperature lowering products, radioactive phosphorescent or fluorescent contrast diagnostic or imaging agents, libido altering agents, bile acids, laxatives, anti-diarrheic agents, skin renewal agents, hair growth agents, analgesics, pre-menstrual medications, anti-menopausal agents, hormones, anti-aging agents, anti-anxiolytic agents, nociceptive agents, mood disorder agents, anti-depressants, anti-bipolar mood agents, anti-schizophrenic agents, anti-cancer agents, alkaloids, blood pressure controlling agents, other hormones, other anti-inflammatory agents, agents for treating arthritis, burns, wounds, chronic bronchitis, chronic obstructive pulmonary disease (COPD), inflammatory bowel disease such as Crohn's disease, ulcerative colitis, autoimmune disease, or lupus erythematosus, muscle relaxants, soporific agents, anti-ischemic agents, anti-arrhythmic agents, contraceptives, vitamins, minerals, tranquilizers, neurotransmitter regulating agents, wound and burn healing agents, anti-angiogenic agents, cytokines, growth factors, anti-metastatic agents, antacids, anti-histaminic agents, anti-bacterial agents, anti-viral agents, anti-gas agents, agents for reperfusion injury, counteracting appetite suppressants, sun screens, emollients, skin temperature lowering products, radioactive phosphorescent or fluorescent contrast diagnostic or imaging agents, libido altering agents, bile acids, laxatives, anti-diarrheic agents or skin renewal agents.

105. The method of claim 100, wherein the oligo(s) and/or the steroid(s) is(are) administered with surfactant protein A, surfactant protein B, surfactant protein C, surfactant protein D and surfactant Protein E, disaturated phosphatidyl choline (other than dipalmitoyl), dipalmitoyl phosphatidyl choline, phosphatidyl choline, phosphatidyl glycerol, phosphatidyl inositol, phosphatidyl ethanolamine, phosphatidyl serine; phosphatidic acid, ubiquinones, lysophosphatidyl ethanolamine, lysophosphatidyl choline, palmitoyl- lysophosphatidyl choline, dehydroepiandrosterone, dolichols, sulfatidic acid, glycerol-3-phosphate, dihydroxyacetone phosphate, glycerol, glycerol-3-phosphocholine, dihydroxy acetone, palmitate, cytidine diphosphate (CDP) diacyl glycerol, CDP choline, choline, choline phosphate; natural or artificial lamellar bodies as carrier surfactant vehicles, omega-3 fatty acids, polyenic acid, polyenoic acid, lecithin, palmitic acid, non-ionic block copolymers of ethylene or propylene oxides, polyoxypropylene, monomeric or polymeric, polyoxyethylene, monomeric and polymeric, poly (vinyl amine) with dextran and/or alkanoyl side chains, Brij 35, Triton X-100 or synthetic surfactants ALEC, Exosurf, Survan or Atovaquone.

106. The method of claim 100, wherein the AIS comprises a steroid of chemical formula (Ia) or (Ib).

107. The method of claim 106, wherein the AIS is selected from budesonide, testosterone, progesterone, fluticasone, beclomethasone, prednisone, mometasone, estrogen, dexamethasone, hydrocortisone, triamcinolone, flunisolide, methylprednisolone prednisone, hydrocortisone, or analogues thereof.

108. The method of claim 100, wherein the first and second active agents are administered systemically or topically.

109. The method of claim 100, wherein the first and second active agents are administered as an oral, intrabuccal, intrapulmonary, rectal, intrauterine, intratumor, intracranial, nasal, intramuscular, subcutaneous, intravascular, intrathecal, inhalable, transdermal, intradermal, intracavitary, implantable, iontophoretic, ocular, vaginal, intraarticular, otical, intravenous, intramuscular, intraglandular, intraorgan, intralymphatic, implantable, slow release or enteric coating formulation.

110. The method of claim 101, wherein the ubiquinone is administered orally.

107. The method of claim 106, wherein the oligo(s) and the AIS is(are) administered intrapulmonarily, into the respiration, nasally, or by inhalation.

108. The method of claim 106, wherein the oligo(s) or the AIS is(are) administered as a respirable or inhalable formulation, optionally an aerosol of particle size about 0.05 to about 10 micron.

109. The method of claim 107, wherein the formulation comprises an oligo(s) or AIS of particle size about 0.1 micron to about 5 micron.

110. The method of claim 106, wherein the oligo(s) or the AIS is(are) administered nasally or intrapulmonarily, optionally an aerosol of particle size about 8 to about 100 micron.

111. The method of claim 109, wherein the oligo(s) or the AIS has(have) a particle size about 10 to about 50 micron.

FIG. 1

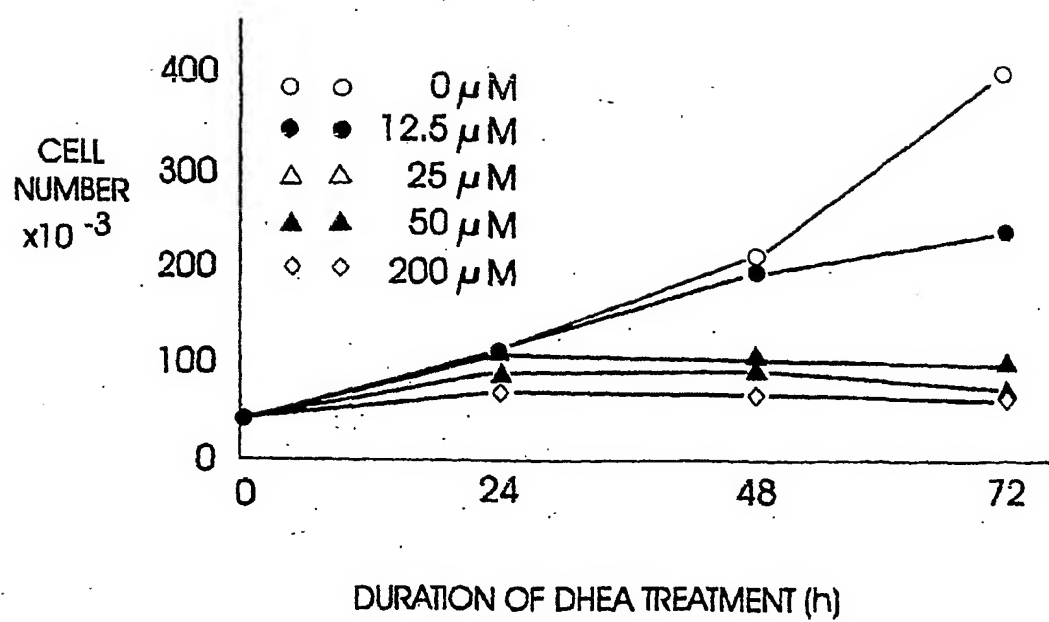
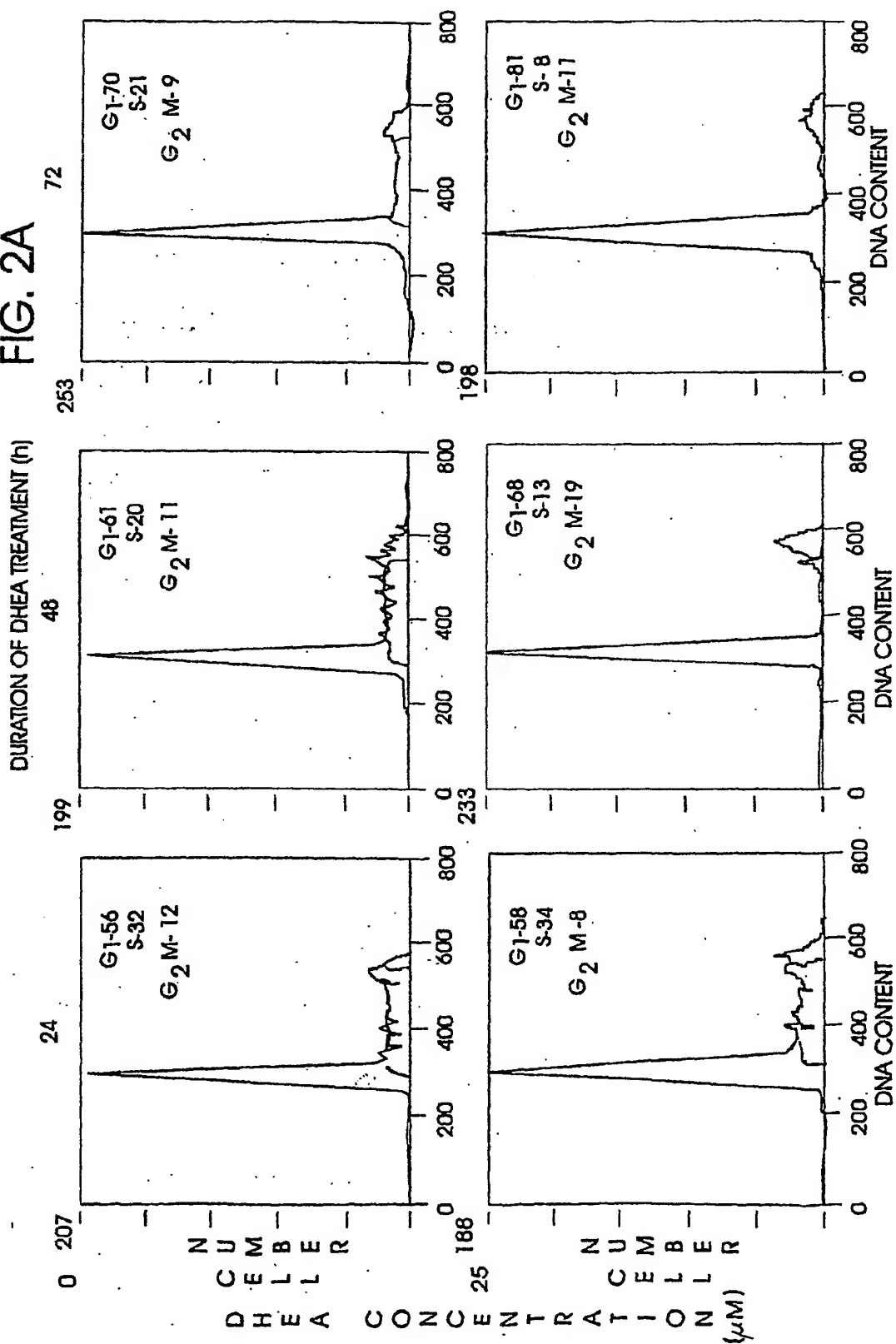
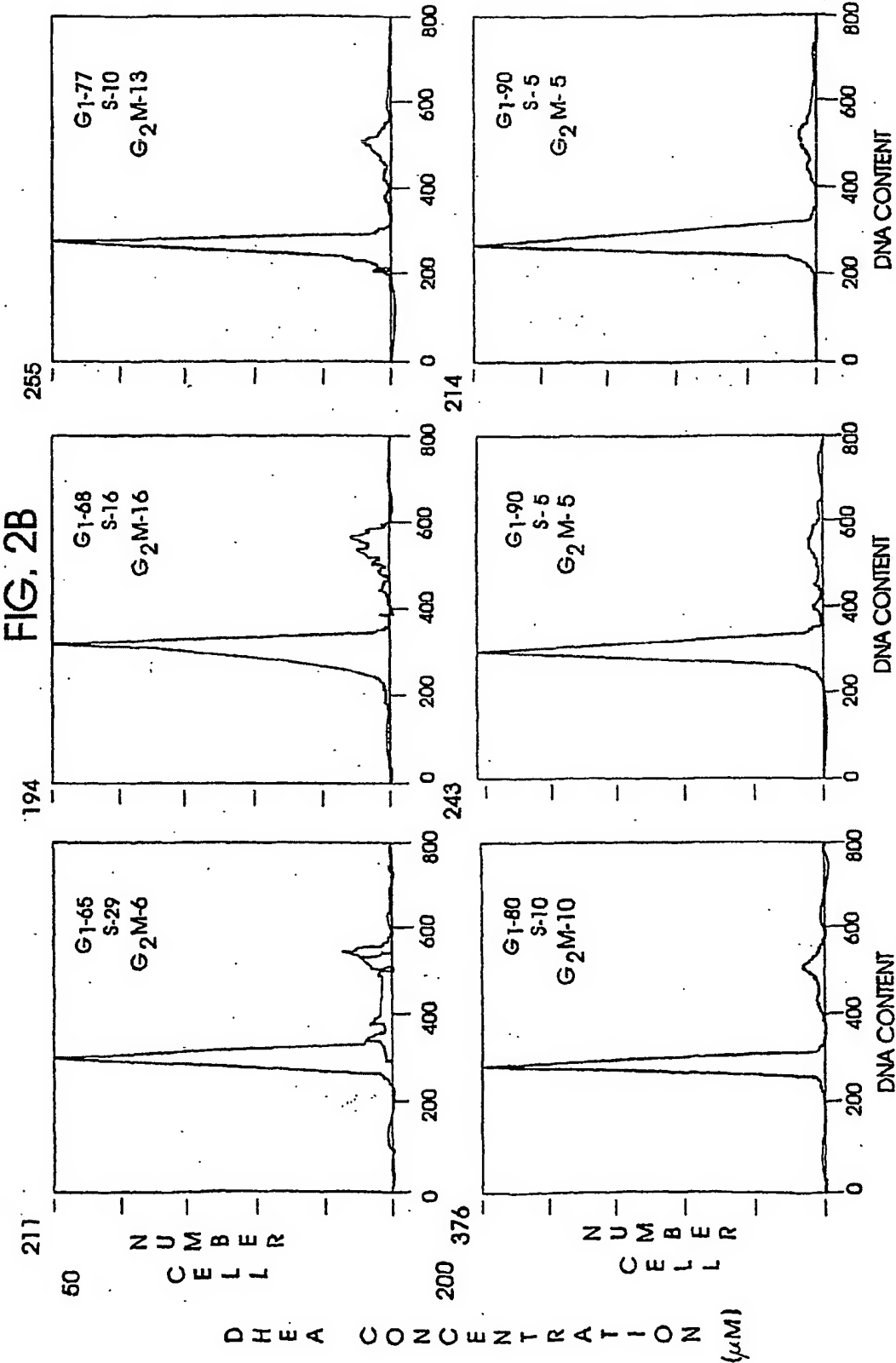


FIG. 2A





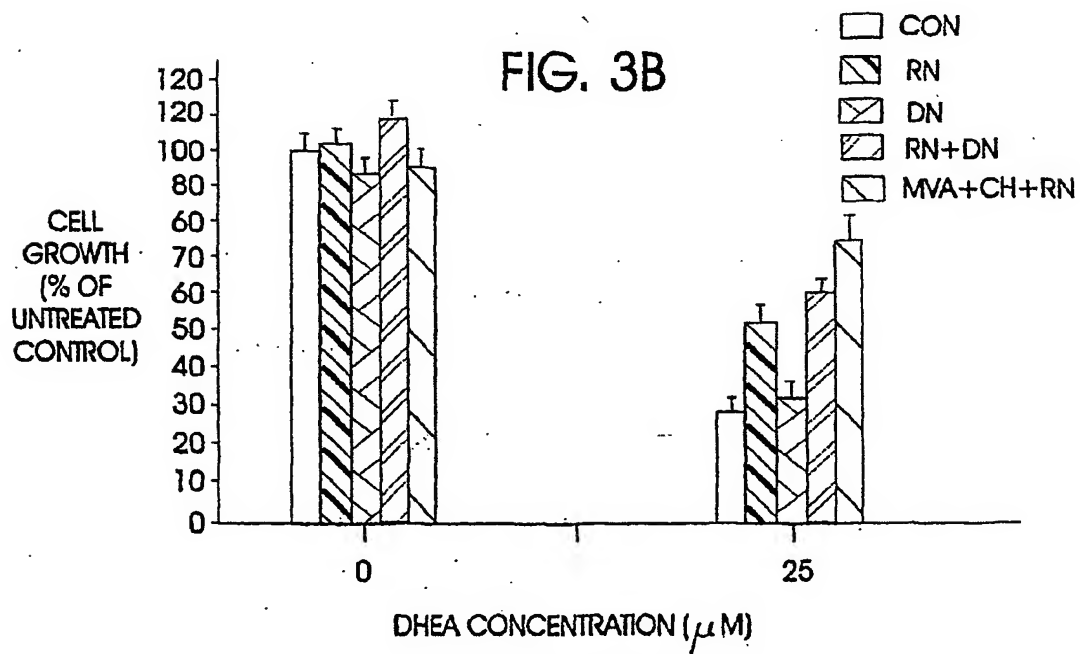
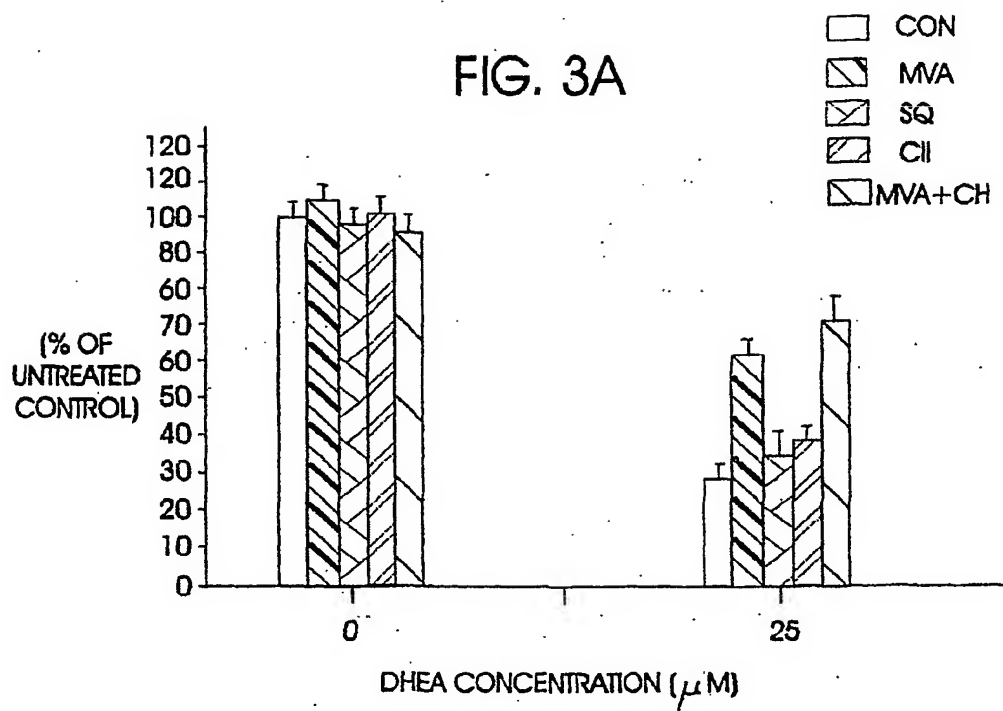


FIG. 4A

DURATION OF TREATMENT

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RECONSTITUTION CONDITIONS

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DNA CONTENT

DNA CONTENT

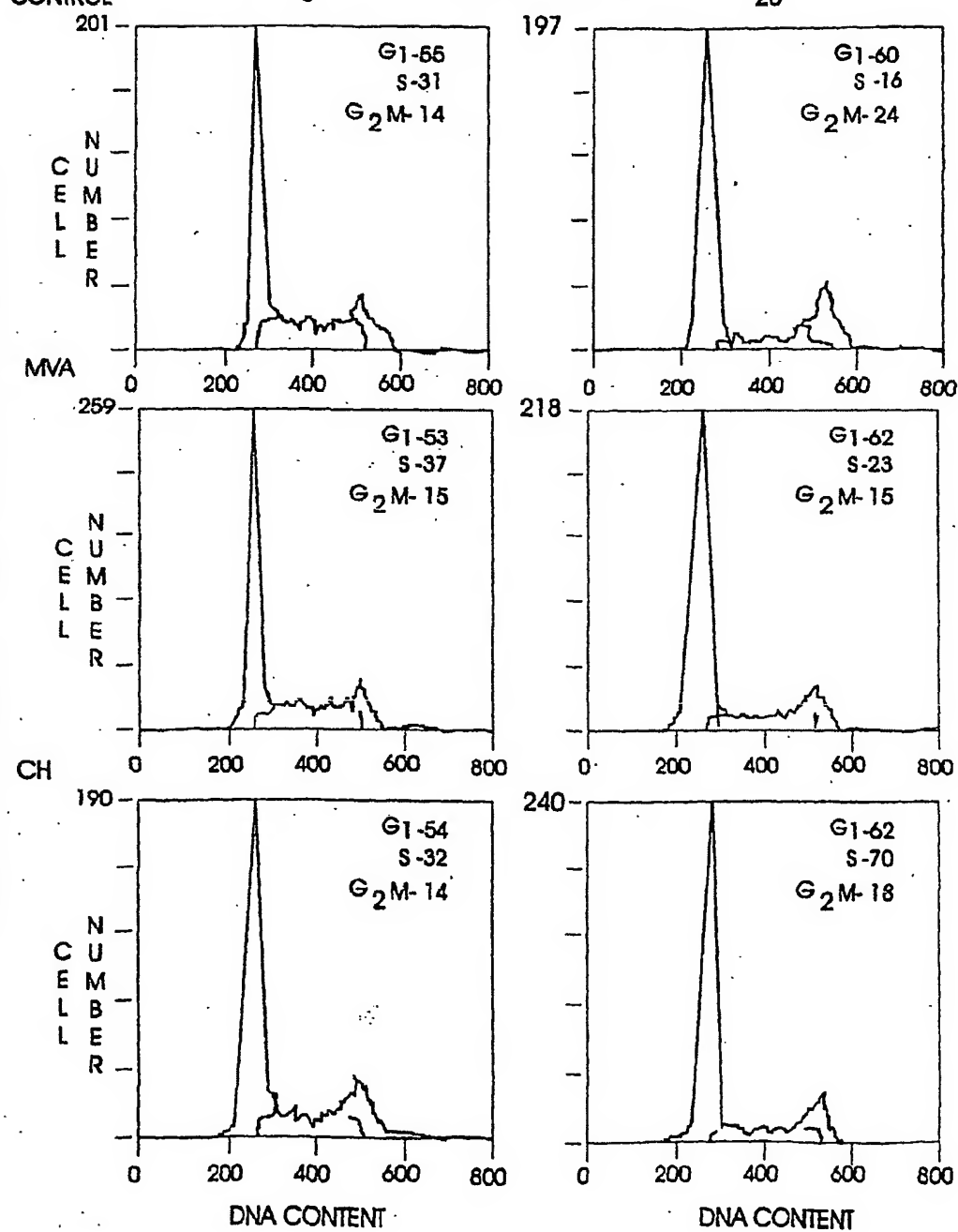


FIG. 4B

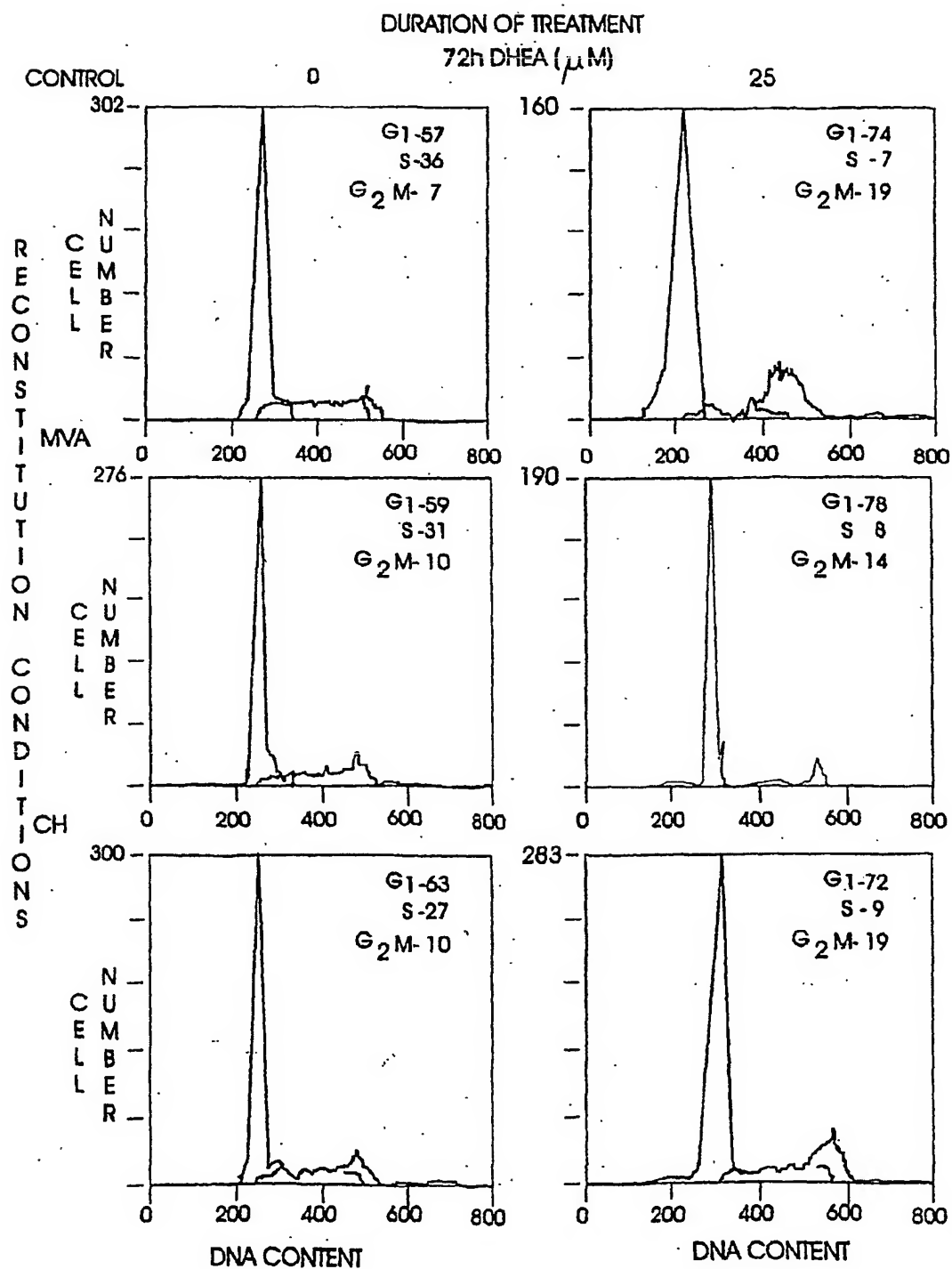


FIG. 4C

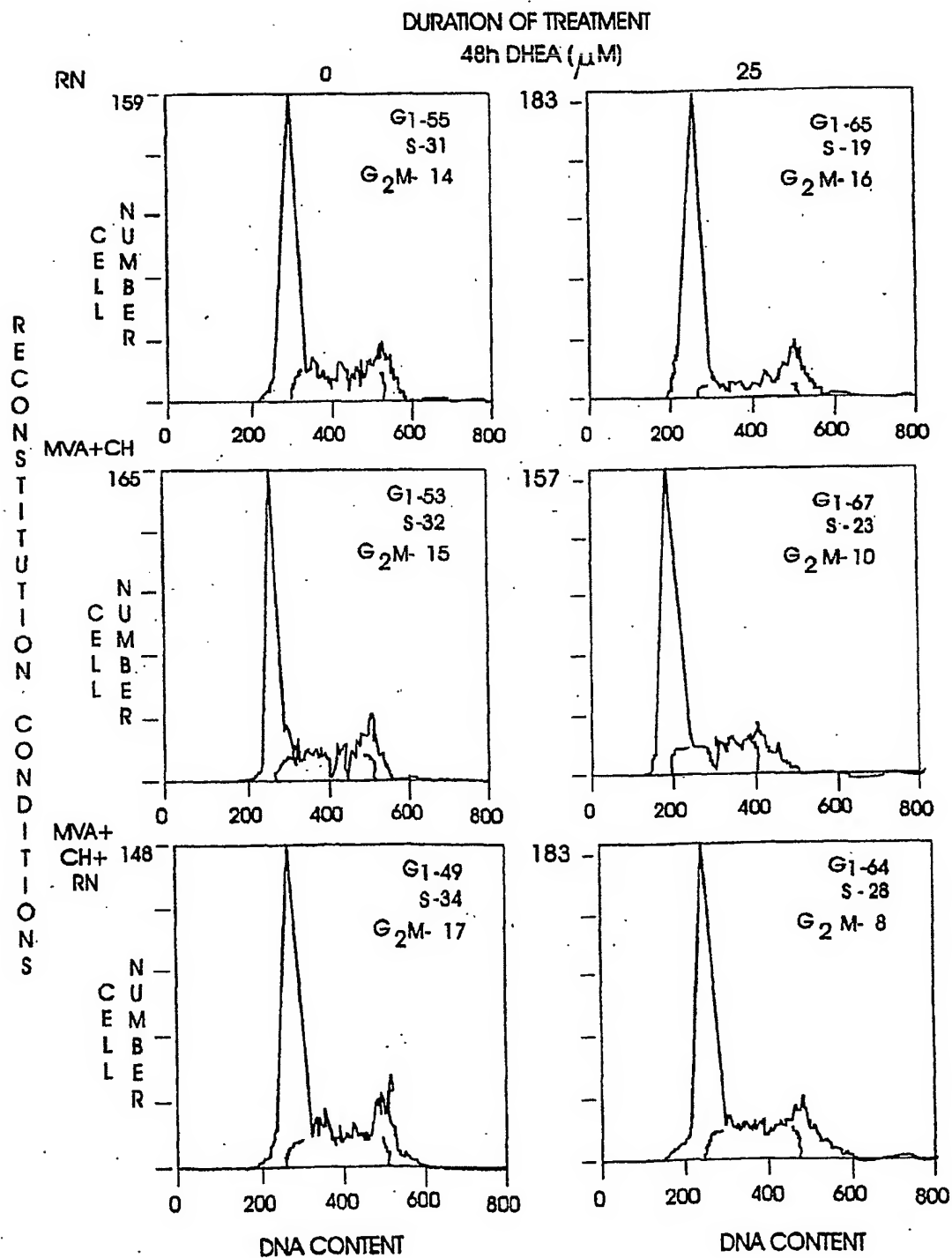


FIG. 4D

